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DEXIS®

User's Manual

Software Release 7

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The DEXIS software includes the following parts copyrighted by other parties:

- The components reading and writing JPEG files are based on the work of the Independent JPEG Group.
- Interfaces to non-DEXIS sensors and to panoramic X-ray equipment are based on work licensed from the respective manufacturers of the equipment.
- The software includes software libraries copyrighted by Microsoft, Inc.

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CHAPTER 1
Introduction

1.1 WELCOME TO DEXIS

Welcome to the exciting world of DEXIS! And thank you for your recent investment in the DEXIS Digital X-ray System. We hope you will have an extraordinary experience with our products and services.

Our mission at DEXIS is to develop and support the Digital Radiography community around the world. We seek to build strong partnerships with our doctors and their teams based on long-term, interactive relationships.

Your new DEXIS Digital X-ray System was designed from the outset with you, the clinician, in mind. This is your tool. Learn to use it well and it will become an effective aid in your diagnosis, treatment and treatment planning process.

As with all new clinical tools, it is necessary to invest a certain amount of time for practice in order to become proficient with the DEXIS Digital X-ray System.

We strongly recommend that you register for in-office training with a certified DEXIS instructor and that you and all of your clinical team set aside 4 to 6 hours to learn the system together. This manual is not intended to serve as a substitute for this training. However, as preparation for the training, we do encourage you to read the manual thoroughly and practice with it safely and carefully for at least one week prior to your training date.

Please note that this manual assumes that new users possess basic computer skills and an understanding of the Windows® operating system. Absent this experience, we strongly recommend that you obtain these skills through a computer course, video, or textbook. Your DEXIS representative may be able to suggest (although not endorse) one or more of these computer learning resources.

Unless otherwise stated, in this manual *Click* refers to a single left mouse-click. Most functions in the DEXIS software require a single left click. Erro-

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neous or impatient double-clicking may cause the program to function improperly. Also, as a general request, please give the program time to start and complete each function before clicking again.

Let's start your journey into the world of DEXIS Digital X-ray!

1.2 WHAT'S NEW IN RELEASE 7

As your Image Management Hub, DEXIS is committed to simplify your daily routine. This new release of the DEXIS software offers tools for streamlined transition between program screens and enhanced maneuverability of images, all designed to help you work more efficiently.

New Comprehensive Platform

The DEXray and DEXimage components have been combined into a single program. Switching between the two major components is now much faster, and images can be readily moved between the different screens.

New Overview Mode

This new tool allows you to simultaneously acquire, display and readily manage all four major types of digital diagnostic images on a single screen: intra-oral and extra-oral X-rays (pan and ceph), intra-oral video images, and extra-oral photo images. DEXIS Overview provides a much enhanced level of patient presentation.

New Drag-and-Drop Functions

Drag and Drop functions are now available for rapid movement of images to and from DEXray, DEXimage, and Presentation Panel.

You can:

- Drag image files out of DEXIS and drop them to the Windows Desktop or to folders in Windows Explorer. (Hold down the Control key while dragging to use this function.)
- Drag the enlarged image from DEXIS and drop it into other applications like Microsoft Word or Microsoft Powerpoint. (Hold down the Control key while dragging to use this function.)

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- Drag image files from the Windows file system (Explorer, Desktop, or other locations) and drop them into a DEXIS patient file; thus effectively importing the images.
- Drag images from other applications and drop them into DEXIS.

New Presentation Panel

The new *Presentation Panel* collects together dental images of different types in one space. These images can be presented individually, or in a slide show, they can be printed, or exported, with single commands.The contents of the Presentation Panel can be kept for later use.

Multiple Bitewing Series now Readily Visible

As many bitewing series as are available and fit between the periapical X-rays are now displayed without overlapping. This usually extends to the three most recent horizontal bitewing series or two vertical bitewing series. Additional series are stacked in the usual manner and can thus also be viewed.

Preview on Import

You can now click on an image file before importing it and preview its contents.

Enhanced Export Function

You can now select the location to which you want to export with a simple *Browse* dialog. Special single-click functions have been added for exporting to the Windows desktop and for collecting together images to burn on a CD-ROM.

New Relief Filter

The new *Relief* filter shows X-rays in a topological “Pseudo-3D” format.

Enhanced Magnifying Function

When using the Magnifying Glass, the magnified image is shown as long as you don't deselect the function or select a different image.

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Enhanced Image Security

All acquired images are now temporarily saved and stored on the local hard disk before being transferred to their final location on the server. If network errors prevent proper server storage the local copy will remain until it has been transferred.

Revised X-ray Acquisition Method

The DEXIS X-ray acquisition method has been revised to free up system resources. This permits other simultaneous tasks during One-Tooth-Series.

Redesigned Video Acquisition Dialog

DEXimage contains a new acquisition dialog for intra-oral camera pictures. It allows preview and recall of acquired images.

Additional Implant Models

The following implant models have been added to DEXimplant:

- BioHorizons® Maestro™ (6.0 mm diameter)
- BioHorizons® Prodigy™
- BioHorizons® Maximus™
- Dentsply Friadent XiVE® and XiVE® TG
- Nobel Biocare NobelPerfect™ One-Piece
- Zimmer Dental SwissPlus™
- Zimmer Dental Tapered Screw-Vent®
- Zimmer Dental AdVent®

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Chapter 2

Installation, Care, and Maintenance

Most telephone calls for assistance received by the DEXIS Customer Care specialists stem from inadequate attention to hardware and software installation. Poor care of the DEXIS sensor or DEXIS capture device can result in damage to or destruction of the fragile electronic components. Also, inattention to basic maintenance procedures, including adjustment of the X-ray source, can lead to unacceptable image quality.

We strongly recommend using the installation services of a factory-trained DEXIS engineer or certified DEXIS installer. We also recommend that you engage a qualified computer specialist or an experienced network technician and develop a permanent relationship for your ongoing computer needs. We understand the prospective of "saving money" by implementing a seemingly more cost-effective solution; however, it is our experience that while this may be true in the short term, such decisions are considerably more expensive in the long run.

Naturally, turnover and attrition in a dental office will see team members come and go. The DEXIS Digital X-ray System is a highly sophisticated piece of equipment that must be handled with care and maintained in accordance with the manufacturer's recommendations. Despite the pressures of a busy schedule, please take the time to ensure that all new team members become familiar with the equipment and the care that it requires.

After installing and testing your software, hardware and components, we suggest that you take the time to explore the software and read the on-screen manual.

When calling Technical Support for assistance, please make sure that you have access to the computer on which the DEXIS system is used and on which the manual may be displayed. You will be instructed where to find answers and solutions for your particular questions. This makes for optimal "over the phone" assistance.

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2.1 OVERVIEW OF THE DEXIS SYSTEM

Upon opening your DEXIS kit you will notice three basic components: the DEXIS sensor with its PC Card (also referred to as *PCMCIA Card*, *Mobile Card* or *Board*), the DEXIS installation software and your full set of sensor holders.

2.2 HARDWARE REQUIREMENTS

Our current hardware system requirements are available in the support section on our website www.DEXray.com, from your representative and from our Customer Care Center. As technology changes, our requirements are updated to reflect such changes. Please consult current DEXIS systems requirements before the purchase of any hardware.

2.2.1 HARDWARE PLATFORM

This version of DEXIS software is for use on common PC platforms of the single-user type, including those with networks, both desktop and laptop varieties. The System Requirements for this software are the same as the minimum requirements stated for the operating system installed therein. Note that systems meeting only the minimum requirements may fail to deliver a satisfactory experience. Systems with faster processors, more memory, and bigger, faster hard drives will significantly enhance performance.

2.2.2 OPERATING SYSTEM PLATFORM

This software has been validated for use on the following members of the Microsoft Windows product family of operating systems:

- Windows 98 Second Edition (see below for restrictions)
- Windows NT4 (see below for restrictions)
- Windows 2000
- Windows XP

Do not deploy this software for use on other versions of Microsoft Windows or on other operating systems that emulate the Windows operating system

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unless the software has been validated for use on that platform by our Technical Department.

Most video capture cards are not supported under Windows 98.

Windows NT4 has only limited support for PC Cards; therefore, you need to install the software library *Cardware for Windows NT* in order to use the DEXIS sensor. *Cardware for Windows NT* is commercially available. Most video capture cards are also not supported under Windows NT.

2.2.3 Caution: Hardware & Software Upgrades

Every change in hardware or software exposes your business to risk. Computers containing patient records are "mission critical." Careful consideration is required in order to minimize risk before changes are made to any system that is currently in use. Whether the change is to be made to hardware, to the operating system or to the DEXIS application software, you should be prepared to deal with an unexpected outcome including a catastrophic loss of data. For this reason, we offer the following suggestions for use with mission-critical systems:

Instead of upgrading hardware or operating system, consider purchasing a new pre-configured system. Computers are amazingly inexpensive today; bringing-up a new system in parallel with an existing system is a good way to avoid placing the existing system at risk. The existing system will remain productive while the new system is qualified and readied for full service. Consider the new computer as cheap insurance, but it's even better than insurance because you get to keep it.

If you must upgrade your existing system, consider purchasing an additional hard drive and making a bootable, literal copy of the existing hard drive. Remove the original hard drive and make the changes to the newer (and probably larger) hard drive. With the original hard drive removed from the computer, it is not at risk and all of your data will be safeguarded. If the new changes are found to be unsatisfactory after a suitable evaluation period, you can always re-install the old hard drive and fully restore your previous environment.

Important: Always back-up your data and store it offsite. Before assuming that your back-up efforts have been successful, make sure that you understand the backup process and practice the restore process at least once on

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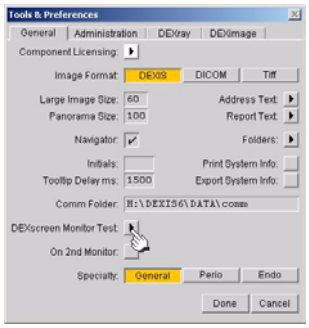
a test system. Verify that both the operating system and data have been preserved.

2.2.4 DIAGNOSTIC IMAGING



It is in the display of images on the screen that your needs dramatically depart from the needs of ordinary computer users. The quality of image presentation will be important in your selection of a monitor and video card. Carefully evaluate your selection prior to purchase. DEXIS provides the DEXscreen program for this purpose. DEXscreen leads you through a variety of tests that evaluate the quality and setting of the monitor. DEXscreen can be accessed from the installation CD-ROM by clicking *Test your Monitor with DEXscreen*. You can also access it from the Tools icon in DEXIS Administration.

DEXscreen is self-explaining and guides you through its menus.

Here are a few things that we have learned after many years of experience:

- Premium monitors are highly recommended. Your needs are similar to those of a professional image scientist or a commercial photographer, so treat yourself to the best quality.
- Premium CRT-based monitors are still better than premium LCD-based monitors.
- A CRT monitor with an *Invar Mask* will be better than one with a mask of any other material.
- Monitors with tiny tri-color dots are better than monitors with colors in stripes or bars. You can examine the color arrangement with a loupe.
- Analog monitors seem to have better images than so-called digital monitors.
- When selecting a notebook computer, chose models with LCD screens recommended for use with photographic imaging.

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2.2.5 SPECIAL HARDWARE REQUIREMENTS

DEXray

The DEXray product requires a PCMCIA interface. These interfaces are also referred to as PC Card Readers. Most notebook computers include PC Card Readers while most desktop computers do not. It is not possible to add an external PC Card Reader to a notebook computer that does not have one built-in. Approved PC Card Readers for desktop computers are available from your DEXIS Representative. These accessories are easy to install and can be retrofitted to desktop computers with one available 3.5" floppy disk drive bay and one available PCI or ISA card position (specify PCI or ISA). Please refer to "Hardware Installation" on page 12 prior to installing this accessory.

Also available is DEXbox, an interface module for the DEXIS card and sensor that is connected to the local area network, controlled from computers on that network. The use of DEXboxes is recommended if the controlling computer does not have a free slot, or if it is too far away from the chair.

DEXimage

DEXimage requires an image source and a capture device. The quality of the result cannot be better than the quality of the source. Expensive cameras may offer higher resolution still images at low frame rates, while full-motion video cameras may capture dozens of frames per second, none of them high resolution enough to allow enlargements.

Capture devices may be interfaced directly to boards installed in the back of the computer, or to interfaces like USB. The interface you choose may affect the performance or usability of the result. Ease of use is also important. A product that requires the user to transfer images from camera to computer in order to send images may be less usable than a product that transfers images in a "hands free" fashion.

Always test your camera installation as a stand-alone before interfacing to DEXimage.

A foot pedal can be used in DEXimage to start and stop the live video and to capture still pictures. DEXimage can handle foot pedals connected to a

serial port and pedals connected to a game port. Some cameras have a capture button that can be used instead of a serial port foot pedal.

DEXscan

DEXscan requires a scanner. To scan ordinary paper images, such as your signature or office logo, a standard scanner may be used. If you intend to scan X-ray images a scanner with a transparency adapter is required. Be sure to select a scanner that is recommended by DEXIS and that has an interface that is appropriate for your installation.

2.3 Hardware Installation

2.3.1 PC Card Reader Installation

Install the PC Card reader (PCMCIA slot) into your desktop computer following the manufacturer's instructions, typically the card reader's software and then the card reader itself. When you turn your computer on, Windows should recognize the reader and load the appropriate drivers.

If you do not receive the message "New hardware found" call Technical Support for assistance.

Important: Do not plug the DEXIS PC Card in at this time!

2.3.2 DEXIS Provided Foot Pedal

Plug the foot pedal cable into the serial port on the back of your desktop or laptop computer (9 pin male connector). See "Foot Pedal or Wand Capture" on page 102 for instructions on how to use.

Please note: DEXIS provided foot pedals are for use with DEXimage software only. They will not work with any other camera software.

2.3.3 Additional Hardware

Please refer to the specific owner's manuals for information on your computers, printers, scanners, card readers, foot pedals, monitors, and camer-

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as for installation and use. Should you need technical assistance with any of these items, please consult the manufacturer of each specific item.

Again, we strongly recommend employing the services of a factory-trained DEXIS engineer or certified DEXIS installer. We also recommend that you engage a qualified computer specialist or (preferably) a network technician and create a sustainable relationship for your ongoing computer needs.

2.4 SOFTWARE INSTALLATION

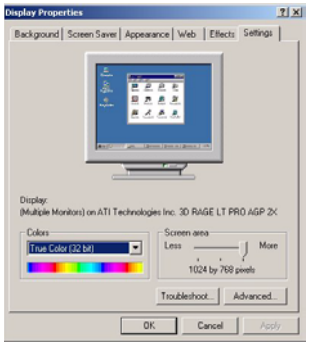
Please follow these instructions to install your new DEXIS Digital X-ray System software.

Please note: Your DEXIS system must be completely installed and tested before training can begin.

After installation, use the verification and testing instructions in “Installation Verification and Testing” on page 147. Following all the instructions will ensure that your system is fully functional. The system will be taught in the *Simulation* mode for all hardware not functioning at the time of training.

2.4.1 DISPLAY SETTINGS

Before installing your DEXIS software, please change your display settings to best view the DEXIS screens.



1. Go to *Start,* then *Settings* and click on *Control Panel*; double-click on the *Display* icon to open the *Display Properties* screen; click on the *Settings* tab at the top.
2. Under *Colors*: Choose *True Color* (24-bit or 32-bit) if available, else choose *High Color* (16-bit). Some older, rather slow computers with outdated video capture cards may limit you to 16-bit color.
3. Under *Screen Area*: Recommended resolution is 1024 x 768, but the software will also work on all other resolutions. Always choose the native resolution for LCD monitors.
4. Click on *Apply* to apply these settings.

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2.4.2 DEXIS INSTALLATION CD

The DEXIS installation software is delivered to you on a CD plus an additional disk entitled *Sensor Disk*. This additional piece of software is used to maximize the resolution of your sensor.

Please note: If you purchased your computer through DEXIS, it will be delivered to you pre-loaded with software and initial information. Please refer to "Installation Verification and Testing" on page 147 to skip the installation steps and go directly to Verification.

2.4.3 INSTALLATION PLANNING

If you plan to run DEXIS on a stand-alone computer, there is not much to plan and you may proceed to the next section.

If you have a local area network, you need to designate a hard disk of one of the computers to hold the DEXIS data (images and patient data). This server disk needs to be shared so that it can be accessed (with read and write access) from all of the computers that will be running DEXIS software and will thus need to access the data. It has to be given a drive letter on all participating computers. We suggest the drive letter "X" (for X-ray), and will use this letter in subsequent examples, although any other drive letter would be fine.

Important: If these terms are unfamiliar to you, please STOP. DEXIS highly recommends that you contact your network professional before proceeding further.

For a network installation, the following steps have to be performed **on all computers** on which DEXIS software is to be used. **Start with the server, where the DEXIS data will be stored.**

2.4.4 RUNNING THE INSTALLATION PROGRAM

To begin the installation, insert the DEXIS installation CD into your CD-ROM drive. The CD is equipped with an *Autorun* feature and will start on its own. Should the *Autorun* feature not work with the CD-ROM drive in your computer, you can launch the installation menu manually: Double-click on the *My*

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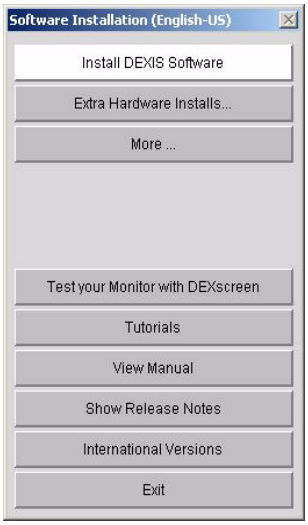
Computer icon on your desktop, then open the CD-ROM drive by double-clicking on its icon, then double-click on the *DEXmenu* icon.

Select Language

If your CD offers the choice, choose ***English-US***, as international versions give international tooth numbers that differ from those used in the United States. The Software CD for distribution in the United States does not offer this choice and automatically advances to the next step.

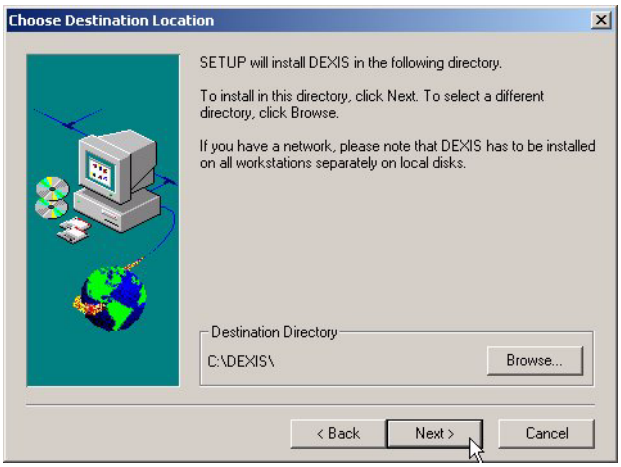
Select Software

Click on *Install DEXIS Software* to install all the major components of the DEXIS program.



Choose Destination Location

During the installation process you will be asked for the folder into which the software should be installed. Typically you should accept the default folder, which is *C:\DEXIS*. In any event, this must be a folder on a local hard disk, not on a network drive.


Choose Destination Location
SETUP will install DEXIS in the following directory.
To install in this directory, click Next. To select a different directory, click Browse.
If you have a network, please note that DEXIS has to be installed on all workstations separately on local disks.
Destination Directory
C:\DEXIS\
Browse...
< Back
Next >
Cancel

Please note: If this is an upgrade, please make sure to install the new software into the same folder as the older DEXIS version. It will overwrite the ex-

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isting program and will not distroy your data. **Do not uninstall** the older version unless requested to do so by DEXIS Technical Support.

Select Data Directory

Next, you will be asked where you would like to store DEXIS data. Typically, this will be *C:\DEXIS\Data* for a non-networked computer. In a network, this will be *C:\DEXIS\Data* on the server and *X:\DEXIS\Data* (or *\DEXIS\Data* on any other drive) on the client workstations.

Please note: If you installed DEXIS on the server first and mapped the drive properly, the correct shared data folder will be automatically suggested by the installation program.

Follow the on-screen directions until DEXIS is successfully installed.

Install Additional Software

Install other software only as it applies to your practice and purchased modules. Please call our telephone support professionals for assistance.

2.4.5 Load Sensor Driver File(s)

Please note: Each sensor has its own specific driver file (delivered to you on a serial numbered CD), designed to optimize the X-ray images from that particular sensor. **The driver file must be installed on every computer** where you intend to use that sensor. Failure to install the correct driver file will result in fuzzy or blurred images.

1. Load the sensor CD into the appropriate drive of your computer.
2. The CD will automatically start. Once opened, click onto *Setup* and follow the on-screen instructions.
3. Install the sensor file into **each** and **every** computer where X-rays will be taken. If you have multiple sensors: please load your first sensor file on your first workstation then proceed to load the second sensor file on the same computer. Click *No* when the install program asks if you are replacing the *Current Sensor*.
4. Repeat this procedure for every subsequent sensor file on this workstation.

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5. When you have finished installing all your sensor files move on to the next workstation. Repeat the installation of files in the **same sequence**. Proceed until all workstations are complete.
6. Open the DEXIS Administration screen. Double-click on the test patient's name to open the DEXray screen. Click on the X-ray Capture icon. Your sensor number(s) appear in the lower left corner of the *Intraoral X-ray capture* screen. Click on *Cancel* to close.

Please note: If your sensor number(s) do not appear, please re-install them. If they still do not appear, call DEXIS Telephone Technical Support. Your Sensor File(s) **must** be loaded prior to training.

Special Instructions for Offices with Multiple Sensors

Each sensor is numbered with a unique identifier. This ID number is listed and color-coded in the X-ray capture window once the sensor software is loaded. Install all of the sensor disks on each and every computer and in order. Label each sensor/board assembly with its appropriate number/color. Now, you will be able to use any sensor on any computer by selecting the sensor from the X-ray capture window, see “Taking X-Ray Images” on page 53.

2.4.6 INSTALLING A LINK TO YOUR PRACTICE MANAGEMENT SOFTWARE

To utilize a link to Practice Management software, you must have a networked system. If you have a non-networked system, please skip this section.

Practice Management-Provided Link

If you have a link purchased from your practice management company, please consult **their** Technical Support for assistance with installation and verification of the link, and directions for its use.

DEXIS-Provided Link

Important: Please contact our Technical Support for assistance with the installation and verification of the link. Do not attempt to install without assistance as this could cause corruption of your existing patient database.

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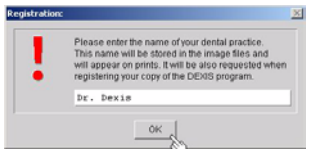
See “DEXIS to Dentrix Link” on page 162, “DEXIS to EagleSoft Link” on page 163, “DEXIS to PracticeWorks Link” on page 164, and “DEXIS to SoftDent Link” on page 165 for instructions for the use of DEXIS-provided links.

2.4.7 Adding Initial Information

Once DEXIS is installed you will find a DEXIS icon on your desktop.


Registration
Please enter the name of your dental practice.
This name will be stored in the image files and
will appear on prints. It will be also requested when
registering your copy of the DEXIS program.
Dr. Dexis
OK

To initiate the DEXIS Administration program, double-click on this icon. A window will appear asking for your Practice Name. Type the name exactly as you want it to appear on printouts. Click *OK* when done.

Next, you will be asked to enter your telephone number. Type it in and click *OK*.

Now, you will be asked to enter a new patient. For setup and test purposes, enter a test patient. Type in a number (such as “1”), a last name (such as “Test”), and a first name (such as “Tim”). Click *Done*. You will now have full view of the DEXIS Administration screen, and patient’s name, Tim Test, will appear on the screen.

For network systems, this initial information should now be accessible across the network and will not need to be added to each workstation.

Please note: If linked to a practice management software, all patients must be added through your practice management software. However, you may add a test patient directly into DEXIS Administration (see above) to be deleted after testing. Alternatively, you may add a test patient within your Practice Management or choose to use an existing patient’s file with which to practice. See “DEXIS to Dentrix Link” on page 162, “DEXIS to EagleSoft Link” on page 163, “DEXIS to PracticeWorks Link” on page 164, and “DEXIS to SoftDent Link” on page 165 for instructions for the use of DEXIS-provided links.

2.4.8 Obtain Registration Codes

From the DEXIS Administration screen, click on the *Wrench* icon and then click on *Component Licensing*. Call DEXIS Technical Support for registration codes for your purchased components. One of our technical representatives will walk you through the process.

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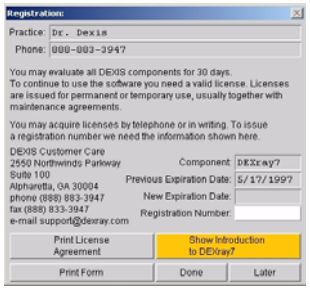
Registration:
Practice: Dr. Dexis
Phone: 000-000-3947
You may evaluate all DEXIS components for 30 days.
To continue to use the software you need a valid license. Licenses are issued for permanent or temporary use, usually together with maintenance agreements.
You may acquire licenses by telephone or in writing. To issue a registration number we need the information shown here.
DEXIS Customer Care
2550 Northwinds Parkway
Suite 100
Alpharetta, GA 30004
phone (888) 883-3947
fax (888) 833-3947
e-mail support@dexray.com
Component: DEXray7
Previous Expiration Date: 5/17/1997
New Expiration Date:
Registration Number:
Print License Agreement
Show Introduction to DEXray7
Print Form
Done
Later

When you click on the button next to the component name or upon opening a DEXIS component that needs a separate license, you will be asked to register. You may choose *Later* and this way try the component for 30 days. For a preview of non-registered components, click on the *Show Introduction to...* button.

Please note: Introductions are not present for all components. If there is no introduction for the component you are trying to register, the button is not shown.

For network systems, you may obtain registration codes on any one workstation for the entire network.

Should you wish to make changes to your practice name or telephone number you will need to re-register your programs.

Your DEXIS installation is now complete. Please go to "Installation Verification and Testing" on page 147 for verification and testing.

2.5 ADJUSTING THE X-RAY SOURCE

The following is a suggested method of setting up your X-ray source in order to effectively take digital radiographs. X-ray machines are somewhat different and may require more or less radiation in order to produce quality radiographs.

Clinical experience has shown that it is a safe bet that you can reduce the radiation by approximately 70% as a starting point if you are using D speed film or by 30% if you have already changed to E speed film. With E speed film you have already reduced the radiation significantly and therefore your savings with digital radiography will be less than with D speed film.

Remember that these settings will be different for anteriors (less exposure needed) and posteriors (more exposure needed). You should take several test images and then adjust the settings accordingly.

X-Ray Head Settings

The radiation of X-ray tubes is controlled by the settings of:

- Voltage (kV or kVp)
- Current (mA)

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- Exposure time (msec) or pulses

Some controls allow for the modification of all of the above, some have fixed settings for current and/or voltage. Although many newer X-ray units have a 'Digital' button, pressing it generally results in a flat reduction in radiation and may not be an ideal setting.

Starting from the settings you use for D speed film, you should modify the settings as follows: Keep the mA setting.

If possible, turn the kV or kVp down to 70. Some practices use voltages up to 90 kVp for film X-rays. These high settings give less contrast in digital X-rays. A reduction by 10 cuts the radiation in half. This has to be taken into consideration when adjusting the time.

Adjust the time or pulses so that the resulting radiation is about 1/3 of the one used for film. Take into account the reduction in voltage, if applicable.

No kVp reduction: reduce time by 60 - 70%

kVp reduction by 10: reduce time by 30%

kVp reduction by 20: leave time at film value

kVp reduction by 30: double the time

Distance of X-Ray Source to Sensor

There is a correlation between the distance of the cone to the sensor and the resolution of the captured image. The radiation that reaches the sensor decreases with the square of the distance. That means if you double this distance, you receive only ¼ of the radiation. Be sure to place the cone as close to the patient's face as possible. If you are using the PositionIt™ parallel ring, place the ring against the patient's face and the cone against the ring.

Important: X-ray machines, even the same brands and types purchased at the same time, differ widely in their performance. In addition, on newer X-ray machines, the "digital" setting on your dial or keypad may not be the ideal setting. We suggest that you test each machine in order to calculate the proper setting for that machine.

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Selecting an Initial Setting

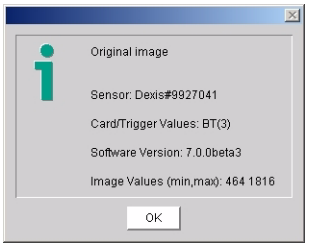
You need to take a few test X-rays with the calculated setting and critically review the images. Connect the sensor to the computer. Place your sensor into the aluminum testblock and place it on a flat surface with the testblock facing up. Aim your X-ray tube so that the long axis of the tube is perpendicular to the flat surface of the testblock. The X-ray head should be directly over the testblock, not more than ½ inch away from it.

Choose or create a test patient and open this patient's DEXray intra-oral screen. Type "X" on your keyboard to open the Intra-oral X-ray Acquisition screen. Select a tooth from the chart. Yellow, then green bands will appear on the tooth chart. Leave the room and trigger the tube.

The DEXray software shows you the enlarged X-ray of the testblock. It looks rather dull, but since the testblock has a similar radiographic density as an average adult molar, the characteristics of the image will indicate whether the exposure is appropriate for X-raying teeth. Two tools help you in evaluating the test image:

Color indicator: The appearance of color indictors in the form of dots offers exposure information at a glance. If you receive a yellow dot, your level of radiation is too low. If you receive a red dot, your level of radiation is much too low. If the dot is blue, the level or radiation is too high. If the dot is black, the level of radiation is much too high.

Parameters: Each image has a group of numbers associated with its exposure. Check the parameters of the enlarged testblock image on the screen by clicking in the space between the date and the tack or on the color dot, if present. This opens the Image Parameters information box. The last line shows *Image Values (min, max)*. The second number (the maximum) is the one to look at. If that number is under 1500, raise the duration setting (seconds or pulses) and test again. If the parameter is over 2500, lower the duration setting and take another test X-ray. If the number is between 1500-2000, note the exposure setting for taking X-rays on anteriors. If between 2000-2500, note the exposure setting for taking X-rays on posteriors.



Please note: Since the afore-mentioned parameter is a measure on how much radiation reaches the sensor, its value depends on the radiation issued by the tube, on the distance between the tube and the sensor, and on the object being X-rayed. The above given numbers are only valid for X-ray-

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ing the DEXIS testblock. When you X-ray actual teeth, you will usually receive a higher parameter value because part of the X-ray shows empty space around and between the teeth that is not absorbing much radiation. As a rule of thumb, the maximum image value is between 2500 and 3000 on well-exposed intraoral X-rays.

Evaluating Images

Use the setting established with the testblock to capture your first images on patients.

Initially, upon taking images on actual patients, **please take the time to critically evaluate the image quality**. If images appear grainy, increase the radiation by increasing the time. If they seem rather dark, you should reduce radiation. There is a wide range in which DEXIS compensates for under- and over-exposure. If you get good results with a particular setting, you might try less radiation to see whether you still gain good results.

Remember, as with standard film, you will need to adjust the duration setting to compensate for tooth type (central incisor to molar) and body type (larger adult to small child)

The settings you ultimately choose, no matter the setting number or parameter it gives, should be what you consider to be suitable for your diagnostic needs.

2.6 Safety Procedures with X-Rays

The rules of dental radiography still apply to digital X-ray systems. Although there is less radiation with digital X-rays, please continue to use protection for your patients. As a clinician, clear the immediate area when exposing the sensor.

When beginning to take DEXray images, please use the guidelines in “Taking X-Ray Images” on page 53. Only take X-rays on patients once you have adjusted your X-ray exposure and taken test images.

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2.7 PROPER CARE OF THE DEXIS HARDWARE

The sensor, cable and board comprise the heart of the DEXIS system. Please treat your sensor and board with the care and respect afforded to other very sensitive electronic devices, such as digital cameras or laptop computers. The system is extremely important to your practice and productivity; it replaces your film, processor and darkroom. Please adhere to these important guidelines to keep your DEXIS system running at optimum levels.

2.7.1 SENSOR AND BOARD CARE

- **Never autoclave the sensor or PC card.**
- **Never soak the sensor.** Wipe using the appropriate hard surface disinfectant only. Avoid bleach or alcohol.
- **Never use hemostats or clamps of any type on the sensor or cable.** Doing so will cause sensor housing or cable wiring damage.
- **Never twist, coil, or wrap the cable tightly, especially around any objects.** This includes coiling it around the sensor board when not in use.
- **Never roll over the sensor cable with wheeled items such as chairs.**
- **Never shut the sensor cable in a drawer, door, or cabinet.**
- **Never pull or stretch the sensor cable** including when disconnecting the sensor from the board or removing barriers. Exposing the sensor cable to these situations will damage the sensor cable causing the sensor to prefire, give an unclear image or render it fatally damaged.
- **Never allow patients to bite down on the sensor or cable.** This will damage the housing and/or cable and lead to a sensor malfunction. We strongly recommend to **use the DEXIS holders** as they are designed to protect the sensor. Latex barriers may give added protection. However, should you choose to NOT use a DEXIS holder, you must **protect the sensor and the cable**.
- **Never store the sensor in an X-ray test block.**
- **Never drop your sensor or PC card.** Dropping the sensor, especially on hard surfaces such as floors and countertops, will shock the system causing the internal electronics to malfunction or be fatally damaged.

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- **Never insert foreign objects into the PC card or sensor pin connector area.** Doing so will cause a short in the sensor pins and will loosen, and/or damage the connection site.
- **Never expose the PC card to moisture.**
- **Protect the sensor and PC card carefully when not in use.**
- **Remove the PC card from the computer when shutting down or starting up the computer.** If the computer is started with the card in the PCMCIA slot, it is subject to power fluctuations that may cause circuitry issues.
- **Remove the PC card from the computer before attaching or detaching the sensor.**

Please note: DEXcare does not cover visible damage to any of the DEXIS hardware components.

2.7.2 CONNECTING SENSOR AND PC CARD TO THE COMPUTER

The sensor is connected to the PC card by a metal connector. This is a precise connection. Therefore, please take the time to learn how this component functions. To separate the sensor from the board, pull them straight apart without twisting or turning either part. Once the two are separated, you may cover the sensor's connection end with the attached cap.

To connect your sensor to the board, align the red dots on the two parts. Snap the parts together firmly until you hear a click.

Carefully insert the sensor/board assembly into the PCMCIA slot of your computer. Please use caution, as there may be 2 slots – keep it level and insert into one slot or the other. In most cases, you will hear two beeps. This is the signal that your computer recognizes the board. Additionally, you may hear two beeps each time you remove the board.

Please note: The DEXIS PC card is *hot-swappable* meaning that you do not have to notify Windows that you plan to remove it. Nor do you need to restart your computer upon inserting the card. Should you receive a message that you "may lose valuable data" by removing hardware with out notifying Windows, please disregard. This does not pertain to the DEXIS card. The only time you should not remove the card is when the *Intra-oral X-Ray Capture* screen is open.

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2.8 REGULAR BACKUPS OF IMAGE FILES

It is extremely important to back up your data on a regular basis as a matter of routine maintenance. DEXIS offers DEXsafe, a one step feature to copy all or part of your DEXIS data to a specific backup drive. Please see our hardware requirements for recommendations on devices. Instructions for using DEXsafe are found in“Backing Up Your Image Files” on page 167.

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Chapter 3

Clinical Use of the DEXIS Sensor Holders

Please become acquainted with your PerfectSize™ sensor. The DEXIS sensor has a unique design using advanced ergonomic principles. It features four rounded corners, a moderate profile, and a smoothly sculptured casing. This design, along with proper placement, translates into enhanced patient comfort.

By placing the electronics on the back the sensor's active area is almost 100% of its surface. This leads to an image approximately equivalent to size 2 film.

If you have not done so, please take some time to review the proper handling guidelines in "Proper Care of the DEXIS Hardware" on page 23 before attempting to use your DEXIS sensor.

3.1 Overview of the PositionIt System

The holders contained in your PositionIt kit consist of:

- 2 Posterior Holders
- 2 Anterior Holders
- 2 Periapical Rings and Bars
- 2 Vertical Bitewing Holders
- 2 Horizontal Bitewing Holders
- 1 Bitewing Ring and Bar
- 2 Vertical Endo Holders
- 2 Horizontal Endo Holders
- 1 Sensor Cable Clip
- 1 Cable Clip Set

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The bars, rings, and holders are similar to the RINN® or XCP® system and function in the same manner. The bitewing holders may be used with or without the bars and rings, or you may use bitewing tabs (along with cable protection). The periapical holders may be used alone or with the rings and bars. When the periapical holders are used without the rings, they function as "stabe" device. The hand-held endo holders may be used with or without the bitewing ring and bar.

The sensor will only fit into the holder one way. Assemble the rings, bars and holders so that the entire sensor area is visible through the ring. This applies to horizontal or vertical bitewing holders, periapical (anterior or posterior) holders, and endo holders.

Place the cable into the groove on the holder whenever possible. This protects it when the patient closes. Should you choose to use the cable clip, place the square hole on the end of the bar and place the sensor cable into the clip. Please see "Cable Protection" on page 32 and the Positioning Tutorial for complete information on cable protection.

3.2 Correct Placement Using the Paralleling Technique

We recommend the use of the DEXIS Sensor Holders contained in the *PositionIt System* included with your new DEXIS Digital X-ray System. Correct placement of the DEXIS sensor in the patient's mouth is essential for obtaining acceptable X-ray image quality. These holders have been specially designed to work with the DEXIS Sensor and the DEXray software.

Please note: Holders shipped after January 1, 2003 are autoclavable, provided you use care and avoid direct contact with metal heating elements. These elements get very hot and direct contact will reduce the lifetime of your holders. Holders shipped prior to this date may be autoclaved but are more sensitive to overheating. **Avoid direct contact with heating elements and do not expose to temperatures above 257° F/125° C.**

The DEXIS sensor in combination with the supplied rings and holders (PositionIt Kit) use the paralleling technique originally developed by the Rinn Corporation. This technique places the sensor in the mouth so that it is parallel to the long axis of the tooth and perpendicular to the interproximal spaces. By drawing an imaginary line through the occlusal/incisal surfaces (occlusal line) of the teeth to be X-rayed, and placing the sensor parallel to

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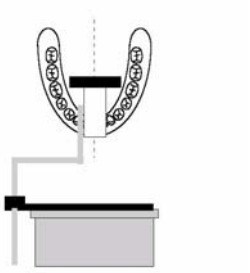
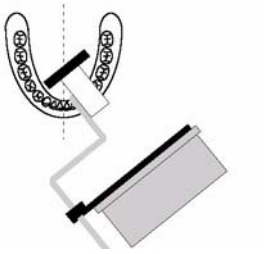
this line, it will be perpendicular to the interproximal spaces. To achieve parallel positioning, the sensor/holder must be positioned away from the lingual/palatal surface and located in the deeper areas of the mouth in all areas except for mandibular molars.

Mandibular Incisor



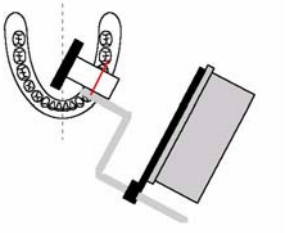
Position the sensor/holder so that it is parallel to the roots of the mandibular incisors. Place either under the tongue or over the tongue, whichever is most comfortable for the patient. If large mandibular tori are present, position the sensor/holder behind the tori, even if it is in the first molar area. Ask the patient to close end-to-end in order to maintain the placement. In the event that the holder does not remain parallel to the roots of the incisors, bisect your angle. Should the incisal edges routinely be missing from your images, place a cotton roll or flap between the tooth and the holder and/or verify that the sensor holder is parallel to the roots.

Mandibular Canine or Cuspid



Position the sensor/holder so that it is parallel to the roots of the mandibular canine. Place either under or over the tongue, whichever is most comfortable for the patient. If large mandibular tori are present, position the sensor/holder posterior to the tori, even if it is in the first molar area. Ask the patient to close end-to-end in order to maintain the placement. In the event that the holder does not remain parallel to the roots of the canine, bisect your angle. Should the incisal edges be routinely missing from you images, place a cotton roll or flap between the tooth and the holder and/or verify that the sensor holder is parallel to the roots

Mandibular Premolar or Bicuspid



Position the sensor/holder so that it is parallel to the roots of the mandibular premolars. Place either under or over the tongue, whichever is most comfortable for the patient. Once you establish that the sensor/holder is parallel to the roots and parallel to the occlusal line, move the sensor/holder to the midline. Ask the patient to close. In the event that the holder does not remain parallel to the roots of the premolars, bisect your angle.

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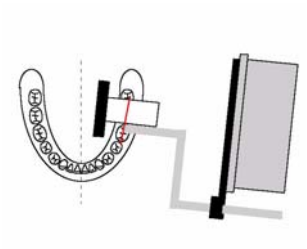
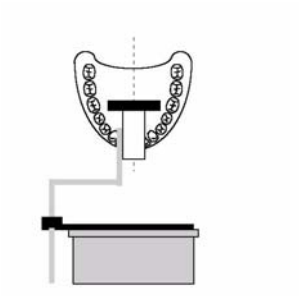


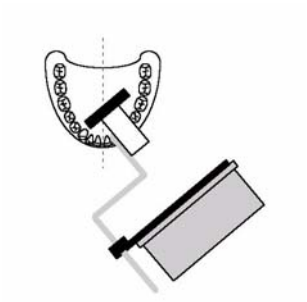
Mandibular Molar

Position the sensor/holder so that it is parallel to the roots of the mandibular molars. Place between the tongue and the teeth. Once you establish that the sensor/holder is parallel to the roots and parallel to the occlusal line, ask the patient to close. This is the only position that does not require placement in the midline for comfort. In the event that the holder does not remain parallel to the roots of the premolars, bisect your angle.



Maxillary Incisor

Position the sensor/holder so that it is parallel to the roots of the maxillary incisors. Once you establish that the sensor/holder is parallel to the roots, move the sensor/holder toward the center of the palate. Ask the patient to close end-to-end in order to maintain the placement. In the event that the holder does not remain parallel to the roots, bisect your angle. If a large maxillary torus is present and you are unable to place the sensor/holder in a traditional position, the sensor/holder must be placed on the torus as you would place traditional film and you must bisect you angle. Should the incisal edges be routinely missing from you images, place a cotton roll or flap between the tooth and the holder and/or verify that the sensor holder is parallel to the roots.



Maxillary Canine or Cuspid

Position the sensor/holder so that it is parallel to the roots of the maxillary canine. Once you establish that the sensor/holder is parallel to the roots, move the sensor/holder toward the center of the palate. Ask the patient to close end-to-end in order to maintain the placement. In the event that the holder does not remain parallel to the roots, bisect your angle. If a large maxillary torus is present and you are unable to place the sensor/holder in a traditional position, the sensor/holder must be placed on the torus as you would place traditional film and you must bisect you angle. If the incisal edges are routinely missing from you images, place a cotton roll or flap between the tooth and the holder and/or verify that the sensor holder is parallel to the roots.

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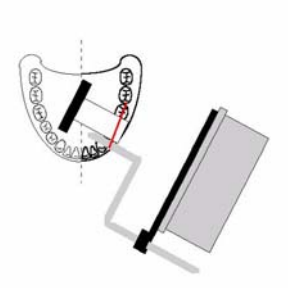
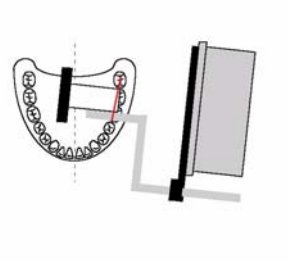
Maxillary Premolar or Bicuspid

Position the sensor/holder so that it is parallel to the roots of the maxillary premolars. Once you establish that the sensor/holder is parallel to the roots and parallel to the occlusal line, move the sensor/holder toward the center of the palate. Ask the patient close. In the event that the holder does not remain parallel to the roots, bisect your angle. If a large maxillary torus is present and you are unable to place the sensor/holder in a traditional position, the sensor/holder must be placed on the torus as you would place traditional film and you must bisect you angle.



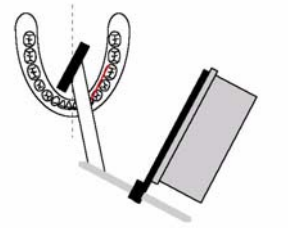
Maxillary Molar

Position the sensor/holder so that it is parallel to the roots of the maxillary molars. Once you establish that the sensor/holder is parallel to the roots and parallel to the occlusal line, move the sensor/holder toward the center of the palate. Ask the patient to close. In the event that the holder does not remain parallel to the roots, bisect your angle. If a large maxillary torus is present and you are unable to place the sensor/holder in a traditional position, the sensor/holder must be placed on the torus as you would place traditional film and you must bisect you angle.



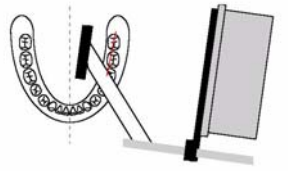
Bitewing - Premolar or Bicuspid

Position the sensor/holder so that it is parallel to the occlusal line, move the sensor/holder toward the midline. Ask the patient to close.



Bitewing – Molar

Position the sensor/holder so that it is parallel to the occlusal line, move the sensor/holder toward the midline. Ask the patient to close.



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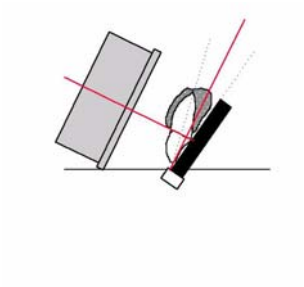
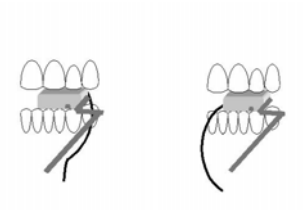


Endo Holders

You may use the bitewing bar and ring with the endo holder to use the paralleling technique. Position the sensor/holder so that it is parallel to the root of the tooth and toward the midline. Ask the patient to grasp the handle after you have placed the sensor in the appropriate position. The patient may close to stabilize if position permits. The patient will not be able to close completely due to the design of the holder. Should you choose not to use the paralleling technique, bisect your angle.

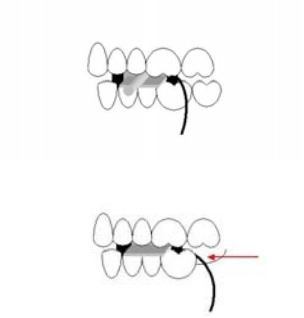
3.3 CABLE PROTECTION

There is a groove on the underside of the periapical holders and a slightly different groove in the bitewing holders. Place the sensor cable into this groove for protection. This works well when the sensor is placed into the holder and then the entire assembly is sleeved.



On those occasions where it is necessary to sleeve the sensor before placing in the holder, due to the thickness of the barrier, the cable may not stay in the groove. In this case, verify that the cable is adjacent to the holder, either to the side that is to the anterior or posterior of the holder. Since the holder will not allow for full closure, the cable is protected. Again, please verify that the cable is not between the holder and the teeth as it may become crimped upon the patient closing.

We strongly recommend the use of the DEXIS holders as they are designed to protect the sensor and cable. However, should you choose not to use the DEXIS holders, you must take steps to protect the sensor and the cable. The use of latex barriers and sponge bw tabs may offer additional protection. However, no matter the barrier or bw tab, you must protect the cable



You must always ask patients to **close lightly** so that they have only the slightest of contact. Do not allow patients to depress the cable. If you feel that you will not have the patient's full cooperation, place an object such as a folded gauze or cotton roll on the tab, to hold the teeth open just enough to keep the cable from harm. You may also place the cable in an area where there are missing teeth or in an area where, anatomically, there is an open space or lack full occlusion.

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To help maintain better control of your sensor when it is out of your hands, use the cable clip to clip the sensor to the patient's clothing. In the event that the patient ejects the sensor, it will not land on the floor.

If necessary, twist the ends of the clip to form an alligator-style clip.

Take hold of the sensor cable approximately 18-24" from the sensor. Gently slide the cable through the opening. Place the cable into the groove.

Clip the holder on to the patient's clothing as shown. You may also clip the cable to your own clothing when you move the sensor form one operatory to another.

3.4 Barriers and Protection

There are many types of barriers that you can use with your sensor, and other hardware. Sensors must be covered with some type of barrier that covers the sensor and at least 3"– 4" of the cable. Barriers made of latex, urethane or plastic (such as a handpiece sleeve) are widely available. Keyboards may be covered with pre-formed plastic covers or plastic wrap. Use a baggie or a low-tack light handle sheet to cover the mouse. Low-tack light handle covers also work well for barriers for laptop touch pads. Use sterile barriers for surgical settings.

Cleaning and Decontamination of the Sensor and Holders

To comply with ADA and CDC guidelines on decontamination, you must follow these steps: First, sleeve your sensor with an appropriate barrier, place into the holder and change the holders as needed. When you complete your images, remove and discard the barrier. Use the appropriate hard-surface disinfectant to wipe the sensor and cable. Never use a solution that contains bleach, glutaraldehyde, alcohol, or other strong chemical components. Your sensor may be washed with warm water and soap, if necessary.

Sterilize/Decontaminate your holders. Please note: The current DEXIS sensor holders are autoclavable, however, certain restrictions apply:

- Always avoid direct contact of the holders with metal trays, instruments, and heating elements.
- Always place holders in autoclave bags

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- Always situate bagged holders into the autoclave so that they are furthest from the heat source.

Exposing the holders to hot metal and placing them close to heating elements will reduce the lifetime of the holders.

Older versions of the holders are more sensitive to overheating. Decontaminate these holders using a cold sterile solution. Please consult the manufacturer's recommendations for the solution you are using.

Should you use only one holder for a patient’s procedure, you may cover the entire assembly with a barrier. However, decontamination is as previously described: Use hard surface disinfectant on the sensor and decontaminate/sterilize your holders.

Please decontaminate you new sensor and holders prior to use.

Please note: Should you have any questions regarding the decontamination of your sensor and holders, contact our Customer Care Center.

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CHAPTER 4

The DEXIS Administration Program

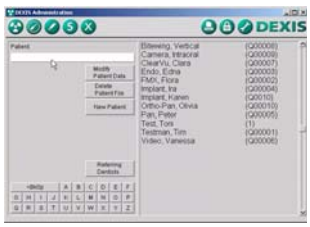
The DEXIS Administration program is the starting point for all stand-alone versions of the DEXIS Digital X-ray System. All other DEXIS programs (including DEXray, DEXimage, DEXwrite, etc.) are accessed through this program after first selecting a patient or creating a new patient.

In addition, this program is the starting point for setting up various global *Preferences* or default settings with regard to your office and clinical team members (*Providers*). Other preferences control the look and feel of the DEXIS program and automate certain frequently used functions.

DEXIS owners who choose to set up their DEXIS programs to interface directly with their practice management software programs will use the DEXIS Administration program much less frequently (primarily to set global preferences) as they will select their patients from the equivalent screen in the Practice Management Software.

4.1 DEXIS ADMINISTRATION SCREEN OVERVIEW

To open the DEXIS Administration screen, double-click on the DEXIS icon on your desktop.



You may apply certain Windows functions to this screen. You may size the screen using click-and-drag. You may also use the three buttons in the upper right to minimize the screen (thus sending it to the task bar — click the tab to bring it back up), maximize or restore a screen, or close a screen.

There are icons across the top of the screen for various functions. When entered, a list of patients will appear on the right side of the DEXIS Administration screen. A patient search field, alphabet keys, buttons to access patient information, and Referring Dentists are on the left side of the screen. If entered, patient pictures are visible in this area.

Place your cursor over any of the icons and buttons and a help bubble, called a Tooltip, will appear with information about the function. Often,

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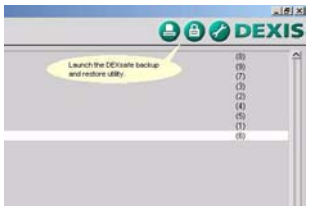
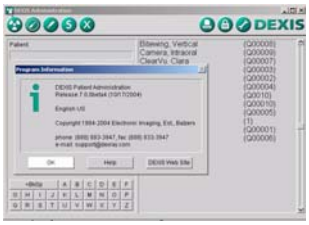


there is also a keystroke that will execute the function. The Tooltip help feature is available throughout the DEXIS system.

There are up to five program icons that appear on the upper left area of the DEXIS Administration screen: The first leads to the DEXray X-ray screen, the second to the DEXimage screen, the third leads to DEXwrite, the fourth leads to DEXclaim, and the fifth closes DEXIS Administration. It is possible for you to choose to hide certain icons. See “Component Licensing” on page 36 for details.



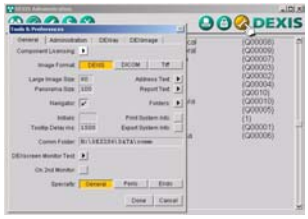
Click on the DEXIS logo icon on the far right to open the Program Information screen. This screen offers program information and will allow you to access the Context Sensitive Help feature and the DEXIS Web Site.

The Help Feature

Click on the *Help* button and your cursor gains a “?” symbol. Now, click on a feature or icon and the DEXIS on-screen manual will open in an Acrobat Reader screen to the page where the use of the function is described. You may zoom in on the screen shots to see more detail.

Click on *DEXIS Web Site* to open the site in your browser if you are online.

Click *OK* to close the Program Information screen.

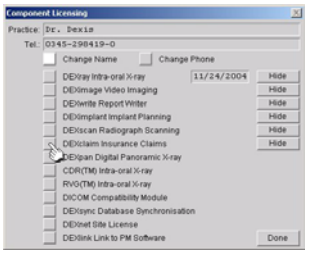


4.2 SETTING GENERAL PREFERENCES

The *Wrench* icon opens Tools and Preferences where a variety of information is entered, accessed, and/or changed.

Click on the General tab to access and set the following:

Component Licensing



Click on the *Component Licensing* button to open the Component Licensing screen: This area shows your practice name and phone number and is the information with which you license the use of DEXIS. You must obtain a registration code for each of your purchased modules. To obtain a code, go to this screen and call Technical Support. Should you decide to change your practice name or phone number, you will need to re-register. To hide icons for non-purchased programs, you may choose the *Hide* button next to each program.

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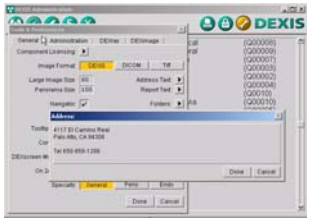
Format

DEXIS stores the images in one of three image file formats: the proprietary DEXIS format, a compressed format; uncompressed TIFF, helpful if your Practice Management software is to directly access the images; DICOM, a universal digital format for medical and dental imaging being standard in hospital environments. The default and recommended format is DEXIS. When exporting images you still can choose a different format, the DEXIS software will convert the images for you.

Large Image Size, Panorama Size

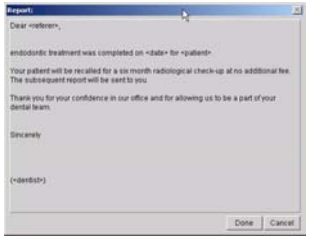
You can set the sizes of enlarged intra-oral and panorama X-rays in percent of the screen width. The defaults are 60 for intra-oral, 100 for panorama X-rays.



Address Text, Report Text

Place the practice address in *Address Text*, up to 5 lines. Choose *Done* to save or *Cancel* to cancel changes. This information appears on your printouts.

Report Text offers a basic letter. Change the letter here for the default – it can be adapted for each printout. The referrer (w/o address), patient, date and provider will merge – no other information is available for merging. The letters created from DEXray, unlike DEXwrite, are not saved and therefore not editable.



Navigator

Check the selection box to show the Navigator when an X-ray is enlarged.

Folders

Click on the arrow button to have DEXIS search for possible DEXIS database folders and to select from the list.

Tooltip Delay

The number in the box is the delay in milliseconds before the Tooltip bubble appears. Choose between 0 and 9999. By choosing 0, Tooltip will not appear.

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Initials

You may place initials into this field, which are then proposed when deleting X-rays. This is useful if the system is always being used by the same person. She/he then need not put in the initials each time she/he deletes an X-ray.

Print/Export System Info

Should you have technical isues, DEXIS tech support may ask you to send information about your computer and the DEXIS installation.

These two buttons issue this information. It is either printed or written to a text file on your desktop. The file can be viewed, printed, or sent by e-mail.

Comm Folder

This is the default folder for importing and exporting images. The DEXIS Setup sets it to the subfolder Comm of your data folder. You may want to change it if you frequently exchange images with another program that expects them in a different location.

Specialty

Selecting one of the specialties will initialize preference settings as mostly used by dentists of the selected specialty. Of course, you may change the individual settings one by one according to your needs, see also “Setting DEXray Preferences” on page 50.

- **General:** Set ClearVu Mode to *General* and Startup View to *Mouth*.
- **Perio:** Set ClearVu Mode to *Perio* and Startup View to *Mouth*.
- **Endo:** Set ClearVu Mode to *General* and Startup View to *History*.

DEXscreen Monitor Test

Monitors are crucial system components, see “Diagnostic Imaging” on page 10. By clicking this button you open DEXscreen, the DEXIS monitor test program, that displays various testpatterns to help you evaluate the suitability of your monitor and monitor settings.

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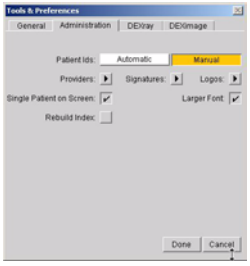
On 2nd Monitor

This button is for two monitor setups that allow you to move windows between the two monitors (needs a special display adapter). If the button is checked, the DEXray and DEXimage screens will be shown on the second monitor, and the DEXIS Administration screen can be moved to either monitor. The DEXIS Administration will remember its position and will show up on the monitor where it has been left.

4.3 SETTING ADMINISTRATION PREFERENCES

In *Tools and Preferences*, click on the *Administration* tab to access and set the following:

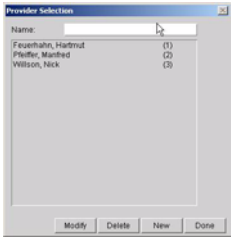
Patient IDs



Should you wish to give your patients specific numbers, choose *Manual*. DEXIS will automatically assign a unique number to each patient if you choose *Automatic*. If you use a practice management software we recommend using manual numbering and entering the IDs issued by that software. If your practice management program is linked to DEXIS, *Manual* must be selected.

DEXIS defaults to *Manual* upon installation.

Providers



Click the *Providers* arrow to open the *Provider Selection* screen and view the list of providers for the practice. A search field is located at the top of the screen. To use the search function, type the first few letters of the provider's name until the name appears.

To add a new provider, click *New* to open a blank *Provider Data* screen. Type the last name; DEXIS will capitalize the first letter. Use the tab or arrow key to go to the next line and add a first name. Again, DEXIS will capitalize the first letter. Add any other information as desired, including the provider's practice management number or letters under *Ref.#/Initials*. Individual provider logos for use with DEXwrite can be captured with a scanner using the *Acquire Logo* button. See "DEXscan: Scanned Images" on page 109 for scanning instructions. Delete the current logo for this provider by clicking the *Delete Logo* button.

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Click *Done* to save or *Cancel* to cancel.

To modify information for an existing provider, search for the name, click on the name to highlight the line, and then click *Modify* to open the *Provider Data* screen for that particular provider. Alternatively, you may double-click on the name to open this screen. Tab or arrow down to make changes.

To delete a provider, click on the name to highlight the line, then click *Delete*. The provider will no longer show on the list; however, patients attached to this provider will still show the providers name on their *Patient Data* screens until another one is selected.

Signatures and Logos

These items are used to scan signatures and the practice logo for use with DEXwrite. You may also access these functions from DEXwrite Preferences; see "Setting DEXwrite Preferences" on page 124. See also "Scanning a Signature or Logo" on page 114.

Single Patient on Screen

If this option is chosen, all DEXray and DEXimage screens are automatically closed when a new one is opened. Selecting this option is recommended so that images are not entered by mistake into the wrong patient's file.

Larger Font

Select the Larger Font box to increase the size of the font on the patient list. This change takes effect after first closing and then reopening DEXIS. Upon installation, the font defaults to the larger size.

Rebuild Index

If you experience a loss of database information, DEXIS tech support will use this feature to help you rebuild the database. Please do not use this feature without assistance.

DEXray and DEXimage Preferences

Each screen has its own preferences and defaults. You may access the programs' preferences here or from their actual screens. Please see "Setting

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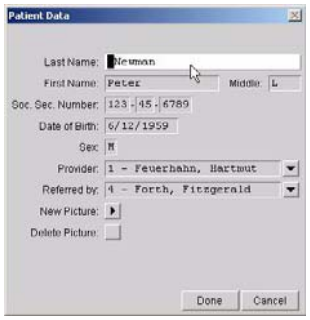
DEXray Preferences” on page 50 and “Setting DEXimage Preferences” on page 95.

4.4 ENTERING PATIENT DATA



The patient list is shown on the main DEXIS Administration screen. You may use the scroll bar to the right to search for a patient. The search field for patients is located in the top left side of the main screen. Type the first few letters on the patient’s name until the name is visible. Instead of typing, you may click on the letter buttons. To select a patient, click on the name; the line then becomes highlighted.

To add a new patient, click the *New Patient* button to open a blank Patient Data screen. Type a number, if applicable. Tab or arrow down to the next line. Type the last name; DEXIS will capitalize the first letter. Tab or arrow to the next line and add a first name. Again, DEXIS will capitalize the first letter. Add any other information as desired. The Date of Birth may be entered in different formats: with slashes (M/D/YYYY), with dashes (D-M-YYYY), or 6-digit no dashes, spaces or slashes (MMDDYY).

Choose a provider by clicking on the arrow button next to Provider. This will bring up the Provider Selection screen. Click on the name to highlight the desired provider, and then click Select.

Choose a referring doctor by clicking on the arrow button next to Referrer. This will bring up the Referrer Selection screen. Click on the name to highlight the desired name and then click Select.

Use New Picture to insert a patient’s picture via scanner or digital camera. This is covered in detail in “Scanning a Picture for Patient Data” on page 113 and “Taking Digital Photographs” on page 97. Delete the current picture for this patient by clicking the Delete Picture arrow button. Click *Done* to save or *Cancel* to cancel.

To modify information for an existing patient, search for the name and then click on the name to highlight the line. Click *Modify* to open the Patient Data screen for that particular patient. Tab or arrow down to make changes.

Modification of the patient number is a special case: you may freely change the number to one that is not yet given to another patient. You may change

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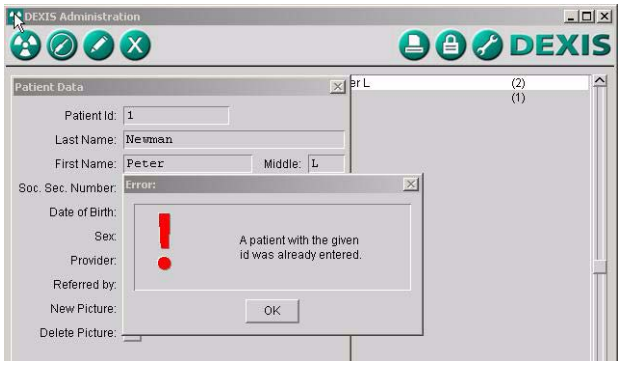
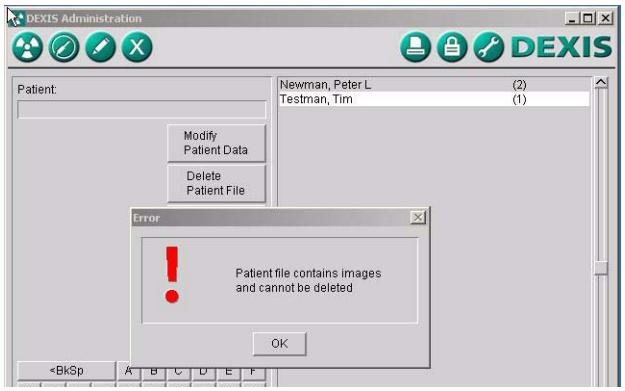
the patient number to a number already in use only if the names of both patients are the same.



To delete a patient file, click on the name to highlight the line and then click *Delete*. As a security feature, all images must be deleted before the patient file can be deleted.



Once a patient is added or selected (the line will be highlighted), click the appropriate icon to proceed to his or her DEXray, DEXimage, DEXwrite, or DEXclaim screen. A light appears under the DEXray and DEXimage icons if there are images in the programs for this patient. Alternatively, you may double-click on the patient's name to open a screen. However, since DEXIS remembers the last screen opened (DEXray, DEXimage or DEXwrite) for the last patient, this is the screen that will open for your newly chosen patient.

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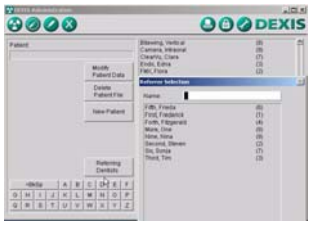
Please note: **If you are using a DEXIS/practice management link, enter all new patients through your practice management software and NOT on the DEXIS Administration screen. See "Interfaces, Bridges, and Links" on page 161 for more information.**

4.5 ADMINISTRATIVE TOOLS

Referring Dentists



Referring dentists need to be entered and matched to patients if DEXwrite is used to write letters to them. Click on the *Referring Dentist* button to see the list of referring dentists. This opens the *Referrer Selection* screen. A search field is located at the top of the screen. To use the search function, type the first few letters on the referrer's name until the name is visible.

To add a new referring doctor (or a doctor or company to whom you refer or correspond), click *New* to open a blank *Referrer Data* screen. Type the last name; DEXIS will capitalize the first letter. Tab or arrow to the next line and add a first name. Again, DEXIS will capitalize the first letter. Add any other information as desired.

Click *Done* to save or *Cancel* to cancel.

To modify information for an existing Referring Dentist, search for the name, click on the name to highlight the line. Click *Modify* to open the *Referrer Data* screen for this particular individual. Alternatively, you may double-click on the name to open this screen. Tab or arrow down to make changes.

Again, click *Done* to save or *Cancel* to cancel.

To delete a Referring Dentist, click on the name to highlight the line, then click *Delete*. The referrer will no longer show on the list, however, patients attached to this referrer will still show the name on their *Patient Data* screens until another one is selected.

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Print Reports

The *Print* Icon allows to print and export reports containing various data:

Print Patient List

This feature prints a list of patients in alphabetical order with patient number, date of birth, gender, and provider number.

Print Provider List

This feature prints a list of providers showing the provider name, DEXIS number and practice management number.

Print Ref. Dentists

This feature prints a list of referring dentists showing each doctor's name, address, phone number and DEXIS number.

Print Activity Report

This feature prints a list of patients and images taken for them over a selected time period. This list also shows deletions plus initials used for each deletion. Additionally, it shows the source of each image (i.e., imported, scanned, etc.)

Export Activity Report

You may also choose to export activity information to a file. This file has one line per activity. The lines contain fields separated by tabulator characters. The format is suited for import into other software such as spreadsheet programs.

Print Queued Letters

When you chose to put a DEXwrite letter into the queue for later printing (see "Queue" on page 128), this button will appear on the DEXIS Administration screen. The function shows a list of all letters in the queue and enables you to print all letters, to print just selected letters, or to delete letters from the queue.

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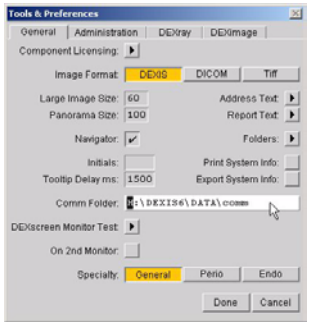
Import from Communication Folder or from Temporary Folder

IAn additional Import icon will appear in the tool bar in two cases:

- The communication folder (set in Tools & Preferences, see “Comm Folder” on page 38) contains images.
- Images are present in the folder used for temporary storage on the local hard disk of newly acquired images.



If you click on that icon, a list with information about each image will be shown: file name, date, patient name, tooth number.

If you double-click on an image entry, the respective patient file will be selected. If the patient file does not yet exist, the New Patient screen will appear with all known information already entered. When you now open the DEXray or DEXimage screen for this patient, the Import dialog will show up automatically.

This mechanism allows for the easy transfer of images between locations if the sending dentist A and the receiving dentist B both have a DEXIS system:

1. Dentist A sends X-rays of patient P by e-mail or on a disk to dentist B.
2. Dentist B opens the X-rays with DEXview and selects *Export to DEXIS*. This will put the X-ray into the communication folder of his DEXIS installation.
3. Dentist B selects patient P either manually or by clicking on the Import button in DEXIS Administration.
4. Dentist B opens the DEXray screen for patient P; the *Import* dialog shows up automatically and allows him to import the X-ray.

The mechanism also allows for convenient transfer of images between two DEXIS databases on the same network. In this case, the Communication Folder entries of both installations should point to the same folder. X-rays can then be exported from one database, and semi-automatically imported to the same patient in the other database.

4.6 INTERFACING WITH PRACTICE MANAGEMENT SYSTEMS

Links are available between DEXIS and most Practice Management Programs (PMP) on the market that contain chairside modules. These links are

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in most cases provided by the PMP company based on information from and in cooperation with DEXIS. For some PMPs, DEXIS has programmed links based on information from the PMP company. Please ask your DEXIS representative what is applicable in your case.

If your PMP does not yet interface with DEXIS, we will be happy to provide the necessary information. It is usually a minor task to implement the link.

If you have a PMP in your office but plan to implement the link only later, you should use Manual Numbering in the DEXIS Administration and use the chart numbers of your PMP as DEXIS patient IDs. This makes a link easier to implement later on.

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Chapter 5
DEXray: X-Ray Images

The DEXray program is the main software application for acquiring, storing, displaying and sharing Digital X-ray images. It is accessed via the DEXIS Administration program directly from all the major Practice Management Software programs or from any of the other main DEXIS programs.

DEXray is a sophisticated piece of software that has been carefully designed and developed to be simple and quick to learn and intuitively easy to use. It is possible to shoot your first X-ray within minutes of initial setup. All unnecessary keystrokes have been eliminated to ensure that attention is focused on the patient, not on the computer, while an X-ray image is being taken. Information about the patient, provider, tooth number, date and exposure settings are automatically captured at the click of the radiation button.

Despite its ease of use, DEXray is enormously powerful in its capabilities. Icons and function buttons enable the user to move, size, enhance, measure, save, and compare images with just a click and/or drag of the mouse.

There are many shortcuts and timesaving tools in DEXray, more than appear in this manual. Typically, there are 2–3 methods for achieving any desired outcome. For users who invest enough time in learning or discovering the shortcuts, tricks, and tools, DEXray will become an invaluable and highly productive addition to the dental practice.

5.1 DEXray Screen Overview

To open the DEXray screen, select a patient on the DEXIS Administration screen and click on the DEXray icon. If you use a link to a practice management program, the method for opening the DEXray screen depends on the program in use.

You may apply certain Windows functions to this screen. You may size the screen using click-and-drag. You may also use the three buttons in the up-

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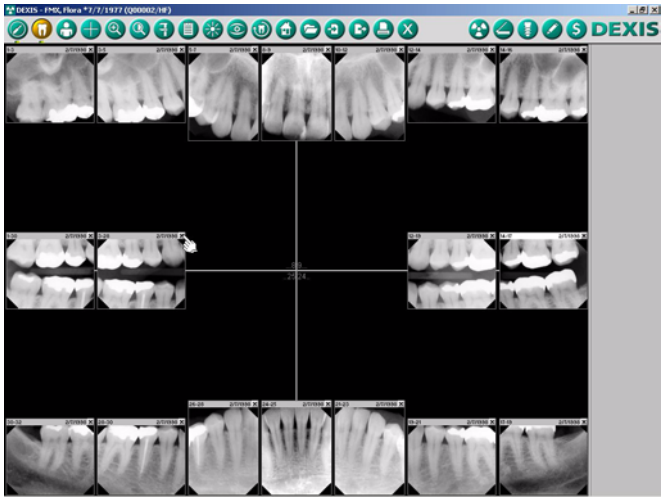
per right to minimize the screen (thus sending it to the task bar – click the tab to bring it back up), maximize or restore a screen, or close a screen. For more information on screen sizing, see “Screen and Window Adjustments” on page 159.

The patient information is shown in the header bar; function icons are located across the top of the main window. Place your cursor on any of the icons and buttons and a help bubble, called a Tooltip, will appear with information about the function. Often, there is also a keystroke that will execute the function. The Tooltip help feature is available throughout the DEXIS system.



The screen is divided into four quadrants. The midline’s teeth numbers appear in the center of the screen distinguishing the location of each quadrant.

The DEXIS Logo icon gives access to program information, DEXray Preferences, Help, and DEXIS Web Site, see “DEXIS Logo Icon” on page 66.

On the right of the DEXray screen is the Presentation Panel, see “Presentation Panel” on page 59.

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5.2 TAKING YOUR FIRST DIGITAL X-RAY

Click on your test patient in DEXIS Administration and click on the DEXray icon: the intra-oral screen of the DEXray program will open. You are now ready to take your first digital X-ray image!

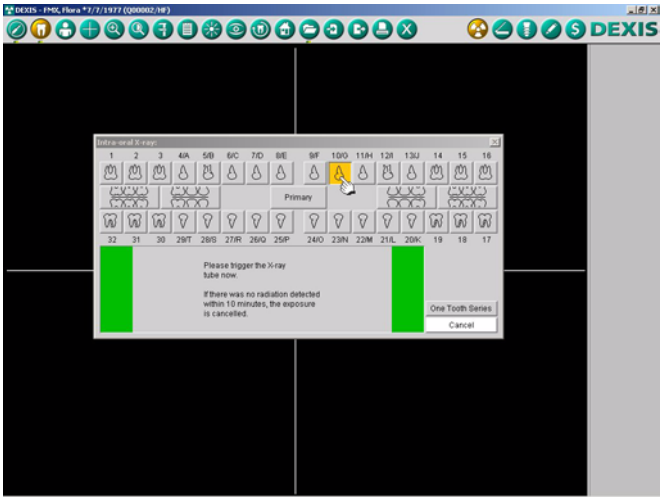
Please note: If you have not done so, please take the time to review "Safety Procedures with X-Rays" on page 22 and "Proper Care of the DEXIS Hardware" on page 23 before you attempt to use the sensor!

Attach the sensor to the DEXIS card and insert the card into the PC Card slot. If this is the first time the card is being inserted in this computer, Windows will recognize the new hardware and install the drivers. Please wait until this process finishes.

Important: Please do not take your first X-ray on a person!

Instead, put the sensor on a counter or table, flat side up; put a metal object on top of it – a ring, coin, key or your favorite dental instrument; aim the X-ray tube over the object, pointing down and about an inch away.

Type "X" on your keyboard to open the Intra-oral X-ray Acquisition screen — it looks like a tooth chart!


DEXIS
Primary
Please trigger the X-ray tube now.
If there was no radiation detected within 10 minutes, the exposure is cancelled.
One Tooth Series
Cancel

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Select a tooth from the chart. Yellow, then green bands will appear on the tooth chart.

Leave the room, lower the setting by 50%, and trigger the tube.

Your first digital X-ray will appear on the screen after a few seconds!

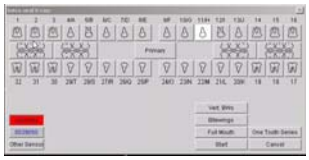
5.3 SETTING DEXRAY PREFERENCES

You may access the DEXray preferences in two ways:

From DEXIS Administration, click on the *Wrench* icon to open *Tools and Preferences*; click on the *DEXray* tab.

From a patient's DEXray screen, click on the DEXIS logo to open the *Program Information* screen; select *Preferences*; click on the *DEXray* tab.

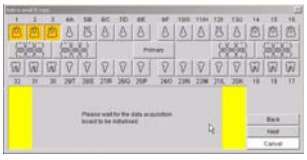
Sensor



Select *No Sensor* for workstations where X-rays will NOT be taken, *DEXIS* for workstations where X-rays are taken, and *Simulation* to have DEXIS simulate taking intra-oral X-ray images. Other choices may be available for additionally purchased modules.

X-Ray Series

When taking a series of X-rays, DEXIS automatically advances from one position to the next once radiation is detected. This method lets you take a series without having to touch the computer in between.



You can use the sequences already in the system or set up your own sequence, up to four in total per computer. To see the three sequences already placed into DEXIS, click on X-ray Series. Please note: For a Full Mouth series, DEXIS uses a sequence that affords the fewest changes of the holders when utilizing the PositionIt kit.

You may edit or overwrite the existing series. However, each group of tooth numbers, such as seen under *Full Mouth 1–3 3–5…*, refers to a certain position on the screen. Click on the boxes showing the tooth numbers for each existing series. Use the arrow keys to move through this box and take note of these groups of numbers. It is strongly suggested that you use the

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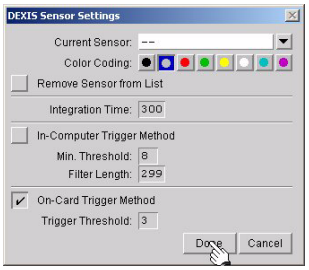
same groups of tooth numbers to set up your own series sequence to keep your images from overlapping on the screen.

To set up your own series, click in a box under Name and give your series a name. Next, under Teeth, type a beginning tooth number for each image in your series, then a hyphen, then the ending tooth number, then a space, and so on. The space lets DEXIS know that you are moving to the next image of your series.

Choose *Done* to save or *Cancel* to cancel.

Sensor Settings



You may assign a certain color to a specific sensor by first choosing the sensor's number from the drop down box under Current Sensor, and then clicking on the desired color in Color Coding. This is helpful if you have multiple sensors in your office: Mark the sensors with different colors and enter the colors here. The sensor selection buttons on the Intra-oral X-ray Capture screen will then show the same colors.

You may remove a sensor from the list by choosing the number in Current Sensor and clicking Remove Sensor.

Please call DEXIS Technical Support before changing Integration Time or Trigger Method.

Click Done to save changes and Cancel to cancel.

Digital Panorama

Click on the down arrow to display a list of installed digital panorama equipment. Select the brand to be used; "--" for no pan, or *Simulation* for simulation mode. If "--" is selected, the acquisition button will not be shown.

Scanner

Click on the down arrow to display a list of installed scanner drivers. Select the brand to be used; "--" for no scanner, or *Simulation* for simulation mode. If "--" is selected, the scan button will not be shown.

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Frame Removal

This feature controls how scanned X-rays are to be handled: set to 0 for normal flat bed scanners to enable automatic cropping of intra-oral X-rays; set to 1 for single-film scanners – automatic cropping is then disabled; set to some value between 2 and 7, if the single-film scanner produces black edges or frames. Start with 2, scan a test X-ray, and increase the value if the frame is not reliably removed. You need to select the scanner before setting this value.

Background Color

Click on the down arrow to choose a background color for the main window.

Startup View

Choose the *Startup View*, to select the view you initially want to be visible when DEXray opens for a new patient. *Mouth* refers to intra-oral images in the mounted view; *History* refers to intra-oral images in chronological order; *Pano* refers to panoramic or cephalometric images. You will have the option to change views according to patient, see “The Image Archive” on page 79.

5 Anterior FMS

Choose *5 Anterior FMS* to have the screen accommodate 5 anterior images instead of 3 per arch.

Flipped View

Choose *Flipped View* to have the patient’s X-rays shown in inside-out view, so that the right images appear on the right side of the screen.

ClearVu Mode

Select which mode of the ClearVu image enhancement you prefer. *General Dentistry* is best suited for detecting caries and fractures while *Perio* shows bone structures and ligatures in the crispest way.

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Auto-Contrast

Check the selection box to have all X-rays appear in contrast mode when initially shown.

Record Measurement

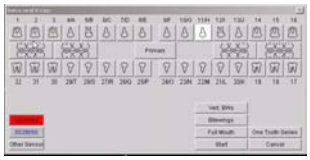
Select the results of which type of measurements you want to record as image notes: all types of measurements, canal measurements only, or no measurements at all. Whenever you carry out one of the selected measurements, you will be asked whether to transfer the result to notes, see “Measurement on Images” on page 69.

Length of RC File

Set the proposed length of the file to be displayed in Canal Measurement, see “Endodontic Measurement” on page 71.

Once you added to or changed items in DEXray Preferences, choose *Done* to save changes, *Cancel* to cancel changes.

5.4 TAKING X-RAY IMAGES



Click on the X-ray capture icon or hit “X” on your keyboard. This will open the Intra-oral X-ray screen. If applicable, choose the appropriate sensor from the numbers on the lower left area of this screen. Although you will be able to use *Other Sensor*, choosing the appropriate sensor will result in an image of better quality.

Please note: You need to be in the patient’s intra-oral X-ray screen to acquire intra-oral X-rays. If the extra-oral X-ray screen is your current screen, the X-ray capture icon will start acquisition of a pan or ceph instead.

5.4.1 TAKING AN INDIVIDUAL IMAGE

Click on the desired tooth or range of teeth on the chart, or type the tooth number and hit the Enter key. The tooth will be highlighted in gold and green bands will appear (think of this as “green means go”). Also, a message will display, *Trigger the X-ray tube...* . You have up to 10 minutes to take your image. After 10 minutes, you will receive a *timed-out* message. If this happens, you need to bring up the Intra-oral X-ray screen again as de-

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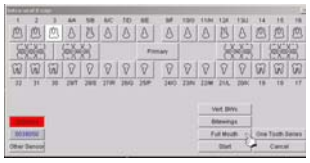
scribed above to restart the process. When you re-enter this screen, DEXray remembers the tooth number last chosen. Click *Start* or hit the *Enter* key to receive your green bands.

Now, position the sensor in the patient's mouth, position the cone close to the face and expose the sensor as you would with film (but of course using less radiation). Once radiation is detected, the sensor will capture the X-ray and the enlarged image will appear on the screen.

5.4.2 Repeating an X-ray

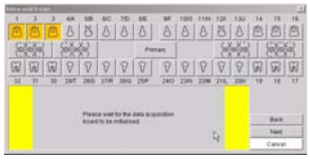
If you want to take an X-ray of a tooth (or range of teeth) for which you already have an X-ray, enlarge the existing X-ray then click on *Repeat X-ray* in the Navigator box or hit "y" on your keyboard. This will open the Intra-oral X-ray screen with the tooth selected and automatically prepared to take another X-ray.

5.4.3 Taking a Series of Images



From the Intra-oral X-ray screen, choose the desired series. The first range of teeth programmed into the series will be highlighted. Now, position the sensor in the patient's mouth to X-ray the highlighted teeth and expose the sensor. Once radiation is detected, a thumbnail (preview) of the image will appear on the Intra-oral X-ray screen. DEXray will highlight the next image area and will show green; your computer is ready to receive the next X-ray of the series.

Please note: It is not uncommon for the thumbnail to appear upside down. Remember, it is only a preview.



If you are not satisfied with your image you can use the Back button on the lower right of the screen to retake the image. If you want to skip forward to a different image area, use the Next button. Please note: You will not need to return to the computer for the duration of the series unless you want to retake or skip areas.

When the series is complete, the X-rays will appear as if in a mount. That is, DEXray will automatically mount your images for you.

For programming your own series, see "X-Ray Series" on page 50

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5.4.4 One Tooth Series

Endodontists often have the need to take several X-rays of the same tooth. You can do that without touching the computer in between by selecting *One Tooth Series* when taking the first X-ray. If this button is selected the software will automatically prepare the sensor to take the next X-ray as soon as one has been taken and is shown on the screen. You cancel out of this loop by clicking Cancel or by closing the DEXray program.

Please note: Since the sensor is always prepared to take the next X-ray, do not remove the DEXIS Mobile card while in *One Tooth Series* mode.

5.5 Image Management Tools

You may control all functions in the DEXIS software by mouse-click or keyboard, whatever is more convenient for you. The Tooltip bubbles will give a short description and keystroke for each item. There is a complete listing of keystrokes in “Keyboard Use and Shortcuts” on page 153.

5.5.1 Selection and Navigation

All X-ray images have a tooth number, date, and close button in a band at the top (title bar) of the image. To select a specific image, click on the body of the image (the actual X-ray part of the image). The title bar turns from gray to white. To select a different image, click on that image. You may also navigate between images with the arrow keys.

You can move the small images by clicking on the title bar (the mouse cursor will become a hook) and dragging to the desired location. This location will be remembered and the image will come up in the same spot the next time you open DEXray. But there is always a “home” position determined by the tooth number, see “Home Icon” on page 64.

You may also move dialog boxes, such as the Navigator, on the screen using this function.

If you have images with the same tooth number, the newest image will be “mounted” on top of the previous image with the image’s title bar visible. Click on the title bar to bring the previous image forward.

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If you have multiple series of bitewing X-rays of different consultation dates, these series will be laid out on the screen without overlapping as long as they fit between the periapical X-rays. With the usual screen format, three horizontal bitewing series or two vertical bitewing series are laid out this way. If you want more series to be visible, you can resize the main window to give it a higher and narrower format.

Enlarging an Image

To enlarge the selected image, click once on the body of the image or hit the Enter key. The title bar on an enlarged image contains the following information and functions: Image tooth number, Image date, Image parameters, and Clean, Tack, Maximize and Close buttons.

To reduce the image, click on the "x" in the upper right corner of the title bar or hit the *Enter* key. Once an image is enlarged, you may click on another image to have it appear enlarged. There is no need to reduce the first image.

The enlarged image may be moved by clicking on the title bar and dragging to the desired location. It may be resized by dragging at a side or corner; the aspect ratio will be maintained.

Full Screen View

Double-click on any selected standard-sized or enlarged image to initiate a full screen view of the image. You may also click on the Maximize button on the enlarged image's title bar. Non-visible portions are scrolled into the screen when you move the mouse to the edge. Double-click again or hit Enter to return to the enlarged image.

Image Parameters

A bar appears at the bottom of all enlarged images. In this bar the image's security status shows in a footnote:

- **DEXray by DEXIS:** Original DEXIS image, not modified
- **Original:** Other original, unmodified image
- **DEXray by DEXIS — Enhanced:** Original DEXIS image, contrast and brightness are adjusted or a filter is active

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- **Enhanced:** Other original image, contrast and brightness are adjusted or a filter is active
- **Scanned:** Image scanned into DEXIS software; alteration of the scanned original cannot be excluded
- **Derived:** Image has been computed, e.g. by subtracting two images
- **Imported:** Image coming from non-DEXIS software; alteration cannot be excluded

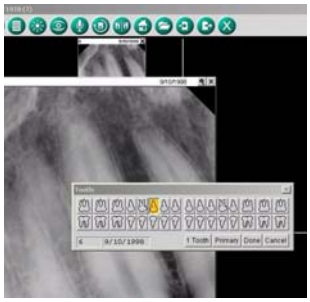
See also “X-Ray Image Security” on page 91.

More image parameters, which may be helpful for technical support, are displayed if you click on the space between the date and the tack of an enlarged image.

Changing Brightness and Contrast

To change the brightness and contrast of an enlarged image, click and drag on the body of the image. Up for lighter, down for darker, left for less contrast and right for more contrast. You may also use the arrow keys to change contrast and brightness. The changed setting will be visible until changed again; however, you may always return an image to its original settings using the Home icon, see “Home Icon” on page 64.

Changing Tooth Number and Date, Mirroring



.You may change the tooth number or numbers of an image by enlarging the image and clicking on the current tooth numbers. The Tooth box (a tooth chart) appears. Click on the tooth or teeth highlighted in gold. This will deselect the unwanted numbers. Now, click on the appropriate tooth or teeth. You may also choose primary tooth numbers. The new number(s) will appear in a box in the lower left.

Click *Done* to save.

The image will be repositioned on the screen and show the new numbers in the upper left.

You cannot change the date of a captured X-ray image. The date showing on your computer when the image is captured becomes the date encrypted into the image, see X-Ray Image Security. To change the date of a scanned

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or imported image, click on the tooth number to bring up the Tooth box. It bears an additional date field, which can be edited

If an X-ray has been inadvertantly scanned from the wrong side, or if some external equipment delivered a mirrored image, you may flip it back by clicking the Mirror button in the Tooth Number box. Images mirrored this way are marked *Mirrored* to avoid confusion.

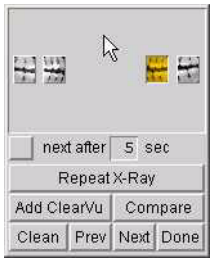
Tacking an Image

An enlarged image may be tacked to the screen by clicking on the tack button located on the right side of the title bar. An image tacked to the screen will remain in position when you enlarge another image or when you switch from intra-oral to extra-oral screen or vice versa. You may move a tacked image as you would any other image. When you have multiple images tacked or enlarged, the Home function will arrange them proportionally on the screen without overlapping, see “Home Icon” on page 64.

Clean Button

Click on the box to the left of the tack to hide objects placed on the images, such as drawn lines and implant models.

The Navigator



When an image is enlarged, a dialog box opens to the right of the image. If in mouth view, this Navigator box shows all images taken on the same date as thumbnails relative to their position on the DEXray screen. If in history view, it shows all visible images as thumbnails. You may click on a thumbnail to display the enlarged image.

Check the box to the left of Next after and DEXray will automatically advance through the images for this date. To turn this slide show feature off, deselect the box. The slide show feature allows an interval of 3 to 30 seconds between images, i.e., the amount of time before the next image appears. You may use the space bar to pause and restart the slide show.

You may take another X-ray of the area shown on the enlarged image by clicking *Repeat X-ray* or by hitting “Y” on your keyboard, see “Repeating an X-ray” on page 54.

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If the *Add ClearVu* button is selected, enlarged images are shown side by side in two modes: standard mode and ClearVu, see “ClearVu Icon” on page 64.

You may choose to clear the screen of all but the selected image by clicking on *Clean* or “L” on your keyboard. Click on the button or “L” again to deselect the function.

You may move among the images using the *Prev* (for previous) button, or *Backspace* on your keyboard, and the *Next* button, or *Space* on your keyboard.

Click on the *Compare* button to compare two images. See “The Compare Function” on page 88 for a full description of this tool.

You may hide the Navigator for an image by clicking *Done*. Turn off Navigator entirely in Preferences, see “Navigator” on page 37.

Presentation Panel

The *Presentation Panel* is located on the right side of the screen. You can drag images into this area from the any DEXray or DEXimage screen whether displayed singly or in *Overview* mode (see “Overview Icon” on page 104).

This action allows you to choose images for presentation to patients or compiling to export images for communications with colleagues, study clubs, or insurance.

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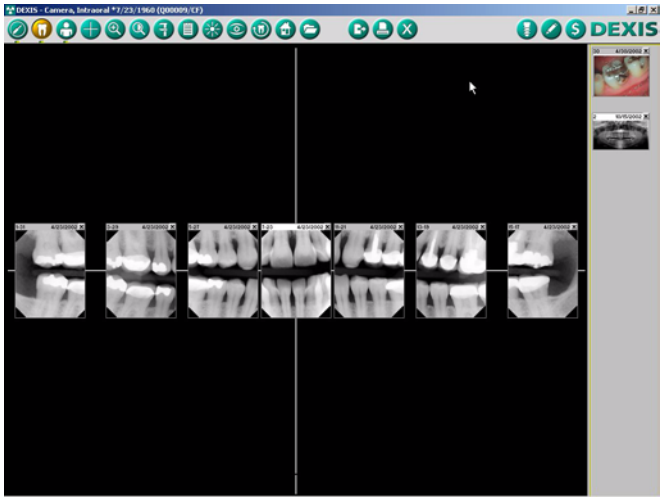
The Presentation Panel can be resized and closed by shifting its left edge. When closed, this edge shows a button; clicking the button opens the Presentation Panel in standard size.



When you click onto the Presentation Panel, it becomes active denoted by a yellow outline. The function icons then relate to the Presentation Panel instead of the main screen, and the DEXIS Toolbar shows only the icons available for use with the images on the panel. The Navigator also functions with these selected images. When you enlarge an image of the Presentation Panel all images not on the Presentation Panel are hidden.

When you close the patient while images are on the Presentation Panel, a popup dialog asks whether you want to keep the contents of the panel for later use.

5.5.2 DEXRAY SCREEN ICONS

An icon will turn gold when initiated. For example, when on the intra-oral screen the *Tooth* icon is highlighted. When a function icon is chosen or an appropriate key is typed on the keyboard, the selected image will automatically enlarge and the function box will open next to the image. In addition, many icons will allow you to drag an image to them thereby opening their

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function. Click again on the icon or corresponding keystroke to terminate its function.

In addition, DEXIS will apply the current function to another image once you click on that image. There is no need to close the current function and image to work on a newly chosen image.

Please remember, the Tooltip is available for help. The corresponding keystroke will show in the help bubble.

DEXimage Icon

The Wand icon leads DEXimage to where images from intra-oral, microscopic, digital cameras or scanned photos are captured, stored and managed. Click on the icon or type “V” (for video) to initiate its function.

A light under the icon signals that there are images for this patient in DEXimage.

Intra-oral and Extra-oral Icons

By clicking on the Intra-oral or *Tooth* icon, you switch to the intra-oral screen.

The Extra-oral or *Head* icon leads to this patient’s extra-oral X-ray screen where digitally captured or scanned panoramic or cephalometric images are stored and managed. Click on this icon or “F” (for facial) to move to this screen.

A light under the icon signals that there are images for this patient in the intra-oral or extra-oral screen respectively.

Please note: By dragging an image to one of these icons, it will be moved to the corresponding screen.

Overview Icon

Click on this icon to see all four DEXIS screens (DEXray intra-oral and extra-oral, DEXimage intra-oral and extra-oral) for this patient. You may also activate the Overview mode by deselecting the icon of a single screen (intra-oral or extra-oral).

You can shift the divider bars thus resizing or closing departmental screens. When closed, the departmental screen becomes a button. Clicking

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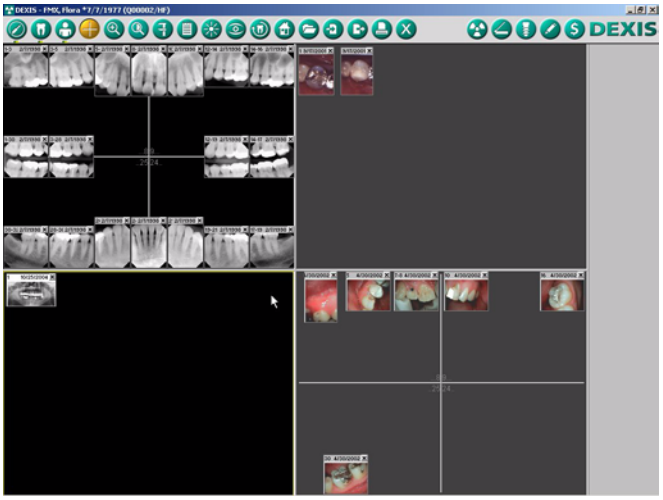
the button opens the screen in standard size. Changes to the divider bars are remembered between sessions.

A screen is considered active when outlined in yellow. The thumbnail images on any screen may be enlarged. Navigator's Clean function hides all other thumbnails on the departmental screens. You may apply the Toolbar's image enhancement tools to any enlarged image.



You may drag and drop thumbnail images from one screen to another.

Deselecting the Overview icon will return you to the original single screen. Double-clicking on any of the four departmental screens will close the Overview mode and open that single screen.

Zoom Icon

Use the Zoom or *Magnifier* Icon to magnify a portion of the selected image. You may also type “Z” (for zoom) to initiate its function.

The portion visible in the ‘bird’s eye frame’ can be changed by clicking to a different spot or by holding down the left mouse button and moving to another area on the image. The ‘bird’s eye frame’ is closed when the Magnifier function or the selected image is closed.

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To magnify the entire image, see “Full Screen View” on page 56. Once in Full Screen mode, the ‘bird’s eye frame’ remains in function, magnifying the already magnified image by another step..

Spotlight Icon

This icon allows you to show an area of the image in maximized contrast. Using the Spotlight cursor, click on the desired area and hold the left mouse button to view the desired section of the image.

Measurement Icon

The *Measurement* tool is primarily used for endodontic and implant measuring on X-rays, although distances on photographic images may be measured if the image shows objects of known size which may be used for calibration. See “Measurement on Images” on page 69.

Notes Icon

This *Annotation* icon will allow you attach text, alerts, and voice notes to images. It will also allow you to draw on an image. To initiate the function, click on the icon or type “T” (for text) or drag an image to the icon. You may

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also access notes by right-clicking on the screen, and then choosing an annotation function.See “Image Annotations” on page 76.

Enhancement Icon

Click on the *Enhancement* icon or type “E” to open the *Image Enhancement* box to adjust brightness and contrast of the selected image and to apply different filters. See “Image Enhancement” on page 66.

ClearVu Icon

The ClearVu or *Eye* icon is a shortcut to the ClearVu mode. Two modes are available and can be selected in *Preferences*: *General Dentistry* and *Perio*, see “Setting DEXray Preferences” on page 50. As discussed under Enhancements, click on ClearVu or “U” on your keyboard to use the ClearVu function. This mode clarifies and sharpens the image. Click and drag in the center of the image or use the arrow keys to change brightness and contrast. Click again on ClearVu or type “U” to turn the feature off.

Rotate Icon

Although DEXIS software orients captured X-rays automatically, occasionally the proper orientation cannot be recognized. In this case the image (standard and enlarged) may be rotated using the Rotate icon. You can also type “R” on your keyboard or drag the image to the icon to rotate it in 90-degree increments.

Home Icon

The *Home* function is activated by clicking on the *Home* icon, by typing “B” (for back) on your keyboard, or by dragging the image to the icon.

There are 3 sub-functions of the *Home* icon:

1. Return the contrast of an enlarged image to standard settings. The function toggles between neutral setting and contrast setting.
2. Standard images that have been moved from their original position are placed back by clicking the Home icon when no image is enlarged.
3. Tack one or more images to the screen using the T*ack* in the upper right corner of an enlarged image. Click on the *Home* icon. The images appear enlarged and proportionately sized without overlapping.

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Archive Icon

The *Archive* icon allows access to the patient's entire image history. It also allows to switch between mouth view and history view. See "The Image Archive" on page 79.

Import Icon

Click on the *Import* icon or type "‹" on your keyboard to open the *Import Images screen*. See "Communications: Import" on page 86.

Export Icon

Click on the *Export* icon or type "›" on your keyboard to open the *Export Images* screen. Alternatively, you may drag an image to the *Export* icon to open the *Export Images* screen. See "Communications: Export" on page 82.

Print Icon

Click on the *Print* icon, or type "P" on your keyboard to open the Windows Print Dialog. This dialog allows you to select a different printer and to access the printer settings. When you have selected the printer, the DEXIS Print dialog is shown, see "Communications: Printing from DEXray or DEXimage" on page 81.

Quit Icon

Click on the "X" icon, type "Q" (for quit) on your keyboard, or click on the "x" in the upper right corner of the screen to leave the patient's DEXray screen.

X-Ray Capture Icon

Click on the *X-Ray Capture* icon or type "X" on your keyboard to open the *Intra-oral X-Ray Capture* screen in preparation for capturing images, see "Taking X-Ray Images" on page 53.

Scanner Icon

Click on the *Scanner* icon or type "S" on your keyboard to open the scanner software in preparation for scanning X-rays, see "Scanning X-Ray Films" on page 109.

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DEXimplant Icon

Click on the *DEXimplant* icon or type "N" to open DEXimplant. See "DEXimplant: Implant Planning and Monitoring" on page 117.

DEXwrite Icon

Click on the *DEXwrite* icon or type "W" on your keyboard to open the DEXwrite program for the selected patient, see "DEXwrite: Chairside Report Generator" on page 123.

DEXclaim Icon

Click on the *DEXclaim* icon or type "L" on your keyboard to open the DEXclaim program for the selected patient, see "DEXclaim: Images as Claim Attachments" on page 141.

Please note: DEXclaim is only applicable for dentists residing in the USA.

DEXIS Logo Icon

Click on the DEXIS Logo icon or click "I" on your keyboard to obtain program information, the *Preferences* button and these two additional features:

Help: Click on this button and your cursor gains a "?" Now, click on an item on the DEXray screen and the manual will open in Acrobat Reader to the page that describes that item's function.

DEXIS Web Site: Click on this button to open the DEXIS web site in your browser.

Click *OK* to close the Program Information screen.

5.5.3 IMAGE ENHANCEMENT

Click on the *Enhancement* icon or type "E" to use different display modes.

Please note: These modes **do not alter the original image files**; they instead extract different information from the image files and emphasize the display to aid in your diagnosis. A mode that aids in diagnosis for one condition may not with another condition. Please inspect the modes thoroughly and experiment with them; you may always return the image to its original settings using the *Home* icon, see "Home Icon" on page 64

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The top of the Enhancement dialog box shows a histogram of the selected image and a curve showing the current contrast and brightness setting. You may manipulate this curve by clicking and dragging at the two crosses.

Contrast

This mode displays the image in a more contrasted way. This mode was designed to help in cavity detection. The keystroke for this feature is “C”.

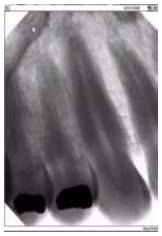
Neutral

This feature will restore the image back to its neutral settings. The keystroke for this feature is “t” (for take back).

Invert

Invert or the keystroke “I” displays the image in negative mode. Click and drag in the center of the image or use the arrow keys to change brightness and contrast. Click again to turn off Invert

Please note: You may combine *Invert* with *ClearVu* and *Invert* with *Color*.



ClearVu

This mode clarifies and sharpens the image. Click on ClearVu, or type “U” on your keyboard, to use the ClearVu function. When *General Dentistry* ClearVu mode is selected in Preferences (see “Setting DEXray Preferences” on page 50), ClearVu resets the brightness and contrast to neutral; to change, click and drag in the center of the image or use the arrow keys. Click again on ClearVu or type “U” to turn the feature off. This mode is re-

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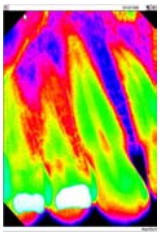
membered between sessions. This means that if you leave it turned on, images will always appear in ClearVu mode until you turn it off.

Darker

This mode compensates for density differences on the image and is highly recommended for bitewing images. Click and drag in the center of the image or use the arrow keys to change brightness and contrast. Click again on *Darker* to turn the feature off. This mode is remembered between sessions. This means that if you leave it turned on, images will always appear "darkened" until you go back and turn it off.

Color



This mode colorizes the image. Click and drag in the center of the image or use the arrow keys to change the colors. Click again on *Color* to turn the feature off.

Relief

This mode gives a 3D appearance to X-ray images by using a topological emboss filter. The *Relief* mode emphasizes small density differences. It may especially help in communication with people not used to reading X-ray images.

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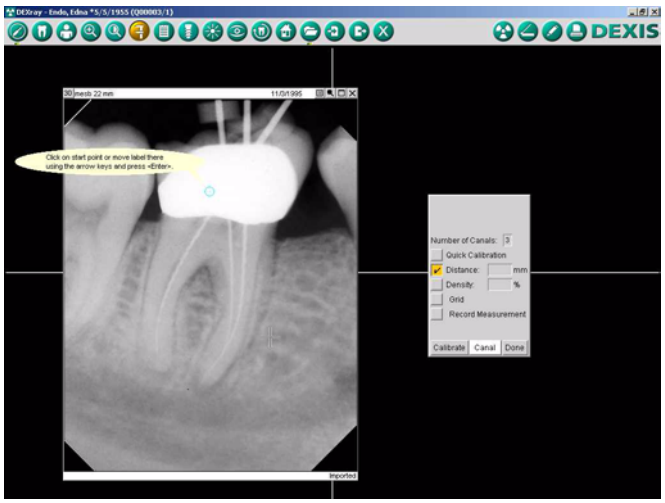
5.5.4 Measurement on Images

The Measurement tool is primarily used for endodontic and implant measuring, although any area on an image may be measured, e.g., a periodontal defect or overhanging margin. .



General Distance Measuring

To begin, enhance the image to its optimum contrast. If desired, enlarge the image by resizing. Click on the *Measurement* icon or type “M” on your keyboard. This opens the measuring function box.

Grid

Click on the *Grid* button. This displays a millimeter grid on the image (centimeter grid for panoramic and cephalometric images). This grid, of course, is in relation to the sensor and does not take into account the foreshortening or elongation of an image.

Distance

Click on the selection button to the left of *Distance*. Click on the image at your start point. You can continue the measurement by adding additional points as necessary, DEXIS will add each subsequent distance to the previ-

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ous one. These multiple points allow you to follow the shape of anatomical structures. You may use *Delete* or *Backspace* on your keyboard to delete points beginning with the last one entered. You may also drag points (shown as crosses) and insert new points by clicking and dragging on segments to conform to shapes once your final measurement is obtained. The total distance is shown in the function box. When you then select the *Record Measurement* box, the distance line remains on the image. The distance appears in a bubble on the image when you left-click on the line.

To delete saved measuring lines, right-click on the line. The *Notes* screen will open with *Line/Polygon* selected. *Delete* as described in “Image Annotations” on page 76.

Click again the *Distance* selection button to start a new measurement.

Please note: Uncalibrated measurement is only possible on images with known resolution. If you want to measure on imported, scanned, or photographic images, you can measure only by comparing to known lengths (calibrated measurement). Calibrated measurement also compensates for projection errors and is therefore always more accurate than uncalibrated measurement. See “Calibrated Measurement” on page 73.

To measure using your keyboard, move the green circle to a start point using the arrow keys, then hit *Enter* to establish a point. Next, move the new green circle to the next point and hit *Enter*. Continue until you have the desired area measured.

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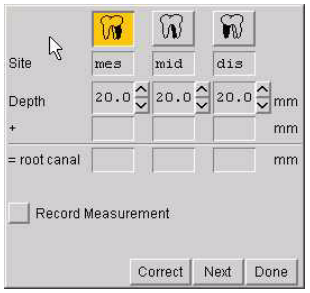
Endodontic Measurement

Initial Measuring with the Distance Feature

To obtain the initial lengths of the canals before files are set, you need to use the general distance measurement as described above. Click on the image at a starting point where the rubber stopper would contact the tooth. Using multiple clicks, follow the shape of this first canal. Click *Record Measurement*. Next, measure the remaining canals in the same fashion. Since this measurement is not calibrated, take into account that the canal(s) may be shown elongated, i.e., the actual canal length might be shorter than the measurement suggests.

Canal Feature



The Canal Measurement compensates for projection errors by calibrating the measurement with the known length of the endodontic file. To use this feature, the image must show the entire tooth and the initial file(s) must be set.

Open *Measurement*, change the number of canals if applicable and then click on *Canal*. Click on the Site boxes to change or give the canal an abbreviated name that refers to its location.

Adjust the file lengths in all the *Depth* boxes by using the up and down arrows or by typing the number in the box. These distances, from the rubber stoppers (or handles) to the end of the files, are known values. The software will need to know these lengths in order to calibrate the remaining information to compensate for possible image elongation or foreshortening.

The default length of 20mm may be changed in DEXray Preferences.

Measuring with the Canal Feature

Starting with the canal whose site box is highlighted in gold, return to your image. The Canal function needs **three** clicks: Click on the **beginning of the file** where the rubber stopper touches the tooth, then click on the **end of the file**, and then click on the **apex**. The software will automatically insert a

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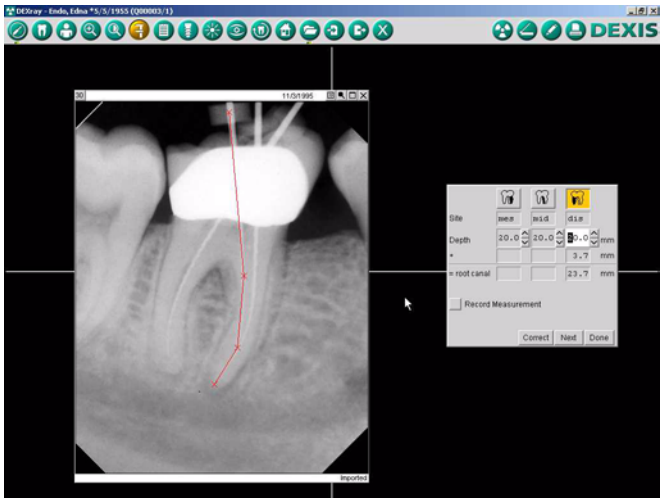
forth point to make the line a smooth curve and also to make it follow the shape of the canal. You may drag the points to further adjust them.



Keyboard users may select the *Correct* button to adjust points. After selecting *Correct*, hit *Enter* and use *Backspace* to move to the desired point. Then use the arrow keys to reposition the point. Hit *Enter* to save the changes.

The measurement dialog box shows the distance between your end-of-file point and the apex- point and the entire length of this canal (the sum of the file length and the remaining distance). Click *Next* to go to the next canal and repeat the process.

Saving information

You can be prompted to save measurements by selecting options in Preferences under *Record Measurement*. After taking your measurement and upon clicking *Done*, should you not have clicked on the *Record Measurement* box, a message will appear asking how you wish to save the measurement. Choose *Graph+Value* to save the line with its bubble display of information. Choose *Value Only* to have the measurement appear in the title bar. Right click on the measurement line to edit information within the Notes screen.

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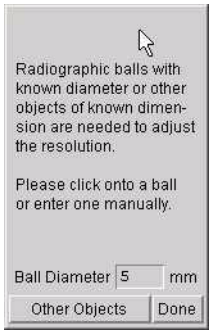
Calibrated Measurement


Radiographic balls with known diameter or other objects of known dimension are needed to adjust the resolution.
Please click onto a ball or enter one manually.
Ball Diameter 5 mm
Other Objects
Done

The Calibration feature provides a more general method to compensate for projection errors by comparing to known lengths. It is most often used by the implant community. To calibrate, there must be an object of known length entirely visible on the image. Also, the area to be measured must be along the same axis as this known object. Examples of such known objects are radiographic balls, the thread of an implant, or the length of a directional post being placed prior to placing the actual implant.

Three calibration procedures are supported by the DEXIS program:

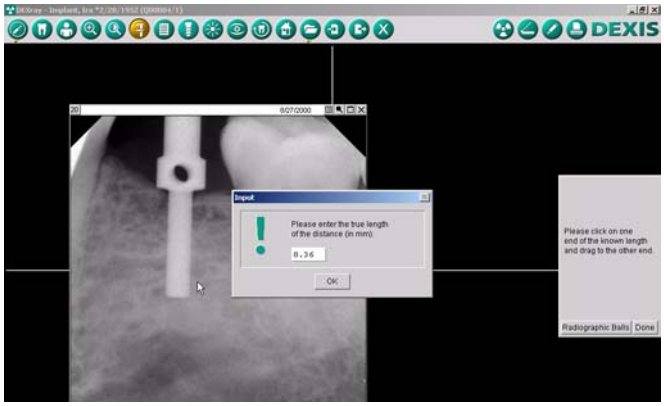
Quick Calibration allows to enter one known length, and then immediately proceeds to measurement. This is the preferred method during surgery.

Calibration with Radiographic Balls allows to enter one or more radiographic balls. This is the preferred method during implant planning. You select this calibration method by clicking on *Calibrate*.

Calibration with Other Objects allows to enter more than one known length, e.g. length and diameter of a placed implant. You select this calibration method by clicking on *Calibrate* then *Other Objects*.

Quick Calibration

Open *Measurement* and click on *Quick Calibration*. Click and drag the known length. An Attention box will open and the approximate length of the object will be shown.


DEXIS
Please enter the true length of the distance (in mm):
OK
Please click on one end of the known length and drag to the other end.
Radiographic Balls
Done

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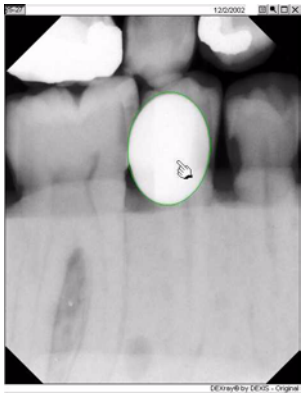
You will be asked to *Please enter true (or your known) distance* to replace the shown distance. If these distances are the same, your image is not foreshortened or elongated. If not, enter the true distance and click *Done*.

Now, measure along the same axis using the techniques for *Distance*; you may use multiple clicks. The new measurement will compensate for any foreshortening or elongation. It will appear in red on the image and in the measurement box under *Distance in mm*.

Record and edit Quick Calibration information as described in "Endodontic Measurement" on page 71.

Calibration with Radiographic Balls



This technique uses radiographic marking balls embedded in a plastic template prior to radiographic examination of the patient. These marking balls will be visible on the radiographic image. The technique is most often used on panoramic X-rays in conjunction with implant planning (see "DEXimplant: Implant Planning and Monitoring" on page 117).

To enter the dimensions of the radiographic balls, open the radiograph and click on the *DEXimplant* icon or on the *Measurement* icon. Then select *Calibrate*. You will now be asked to click on a ball, and the software will find its outline and ask for the diameter. If you have several balls in the X-ray, click on one ball after the other.

In some cases the software might not find the outline of the ball. This is especially the case if the ball is adjacent to a crown or filling. In this case you have to designate the outline of the ball by "dragging" from one end of the longest axis to the other end holding down the left mouse button. Then drag the end points of the shorter axis so that they also lie on the outline of the ball. In the same way you can adjust the ball outline when DEXIS does not find it accurately.

Fine adjustments to the endpoints of the axes can be made by the following method:

- Place the mouse cursor over the point to be moved
- Move the point pixel-wise by hitting the arrow keys of your keyboard

When the outlines and diameters of the radiographic balls have been entered, this information is used for measurements on the X-ray and for auto-

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matically adjusting the sizes of implants positioned on the X-ray. If several balls are present, the dimension of the ball nearest to the measurement or placed implant is used for the calibration.

Please note: Depending on your panoramic X-ray machine, a single radiographic ball might be enough to calibrate the whole X-ray, or several are needed to get the right adjustment in all places.

Once entered, the radiographic ball outlines are stored in the image file and are thus available for later use even after exporting and importing the image.

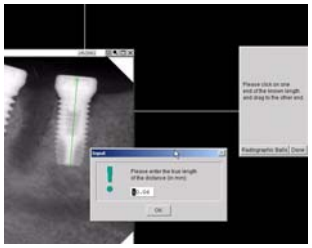
You may delete any entered ball outline by clicking on the center of the ball and dragging it out of the image window while holding down the left mouse button.

Click *Done* to close calibration mode.

Calibration with Other Objects

This technique uses other objects of known dimensions, e.g. placed implants, to calibrate the X-ray.

To enter the known dimension, open the radiograph and click on the *DEX-implant* icon or on the *Measurement* icon. Select *Calibrate*, then *Other Objects*.



You now mark a known length by "dragging" from one end to the other end while holding down the left mouse button. A popup dialog will be shown that displays an estimated length (based on pixel size or previously entered calibration lengths), and allows you to enter the true dimensions.

Fine adjustments to the endpoints of the calibration lengths can be made by the following method:

- Place the mouse cursor over the point to be moved
- Move the point pixel by pixe by hitting the arrow keys of your keyboard

When object dimensions have been entered, this information is used for measurements on the X-ray and for automatically adjusting the sizes of implants positioned on the X-ray. If more than one known length is entered, the software determines which one is best used for calibration. This deter-

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mination takes into account the distance between the known length and the measurement or implant and the difference in direction.

The calibration lengths once entered are stored in the image file and are thus available for later use even after exporting and importing the image.

You may delete any entered length by clicking onto it and dragging it out of the image window holding down the left mouse button.

Click *Done* to close calibration mode.

Bone Density Measurement

The radiographic density of the X-rayed material directly relates to the gray level of the resulting image. If you click on the *Density* button then drag a rectangle on the image, the median density of the selected area will be shown as percentage:

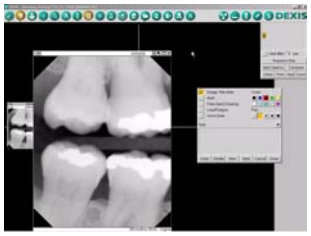
- 0% = black = lowest density
- 100% = white = highest density

The values shown relate to the original image and are not modified by changing brightness or contrast.

5.5.5 IMAGE ANNOTATIONS

The *Annotation* icon will allow you attach text, alerts, and voice notes to images. It will also allow you to draw on an image. To initiate the function, click on the icon or type "T" (for text) or drag an image to the icon. You may also access notes by right-clicking on the screen, and then choosing an annotation function.

Image Title Note



To attach text , select *Image Title Note* on the annotation screen. Next, type text in the text box or click on the down arrow to open the *Select a Diagnosis or Condition* screen that displays categories of conditions and diagnoses from which to choose.

If you have existing text attached to an image you will be asked to choose *Append to Note* in order to add additional text or to eliminate your current note by choosing *New Diagnosis*.

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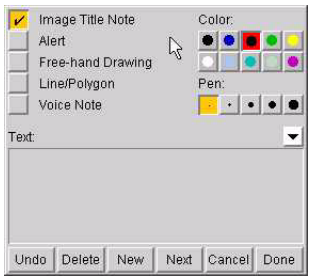

For each category, you may add, edit or replace the text by typing into the appropriate field. Click on the selection box to the left of the diagnosis or condition to select it.

If you edit or add a new diagnosis or condition, you will be asked if you wish to permanently save it.

Click *Done* to save your changes to the list of diagnoses and conditions or *Cancel* to cancel.

Once all selections are made or text is typed, click *Done* to save or *Cancel* to cancel.

The last line of text appears or the last diagnosis chosen appears on the title bar of the image as space permits.

To remove a note, open the function and select *Image Title Note*; click the *Delete* button at the bottom of the *Notes* screen, and click *Done* to save.

Alert

To enter an *Alert* referring to a specific region on the X-ray, open the *Notes* function and then select *Alert*.

Click and drag to draw a box around the area of concern. Select a color and a pen that determines the thickness of the lines.

Again, you may type text here, or pick from the list as described in the previous section. Alternatively you may omit text.

Click *Done* to save or *Cancel* to discard the changes.

If you entered a message it will appear when you click into the box.

To place additional Alerts on the same image, click on the *New* button and add your Alert as previously described.

Edit Alert boxes and attached text by opening the Notes function and selecting *Alert* or by right-clicking into the box. When the Notes screen is open, only the selected box will be shown in color, other boxes will turn gray.

Use the *Next* button to scroll through all Alerts attached to this image. Once your desired Alert box is selected, it will turn colored and the text is visible.

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Edit your text or click on the *Delete* button to delete the Alert entirely. Click *Done* to save your changes.

Free-Hand Drawing and Line/Polygon Drawing

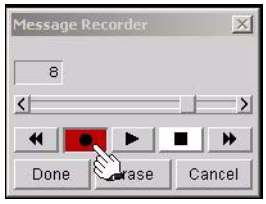
Select either tool to draw on an image. Next, choose your color and pen or line thickness. *Free-hand* allows for free-hand drawing: a new curve is started when you press the left mouse button, it is continued as long as you hold the button down, it is ended when you release the button. *Line/Polygon* will deliver a straight line with each mouse click. Double click ends a polygon; the next click starts a new one.

You may attach text to drawings and polygons by typing it into the provided box or by selecting from the menu offered with the down arrow. This text will appear when you click on an item while the Annotation tool is not open.

Once drawn, save your item by clicking *Done* or click on *Undo* to delete drawn curves or polygon segments, one at a time. *Delete* deletes the whole item. You may draw several items on an image by using the *New* button. In this case, your previous drawing will appear in gray. Use the *Next* button to scroll through the drawings attached to the image.

You may change previously saved drawings or attached text by either opening the Notes tool and select *Free-hand Drawing* or *Line/Polygon*, or by right-clicking on the item you want to modify.

Voice Note



To attach a voice note to an image you must have a sound card and microphone attached to your computer.

To start, click on *Voice Note*. This opens the V*oice Recorder*. There are buttons for rewind, record, play, stop and fast-forward. To record, click on the *Record* button (circle symbol) or type “R” on your keyboard. After recording the message, click on the *Stop* button (square symbol) or type “S” on your keyboard. Click *Done* to save.

Musical notes will appear in the upper left corner of the image to the right of the tooth number(s). Click on these musical notes to play the sound attachment. Alternatively, you can re-open the Voice Notes function and click on the *Play* button (single forward arrow symbol) or type “P” on your keyboard.

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To stop, click on the *Stop* button (square symbol) or type “S” on your keyboard. In addition, rewind by clicking on the *Rewind* button (double-arrows to the left) or type “B” on your keyboard; fast-forward by clicking on the *Forward* button (double arrows to the right) or click “F” on your keyboard. To delete the voice note, click on the *Erase* button.

When adding to a previous sound note, you have several options:

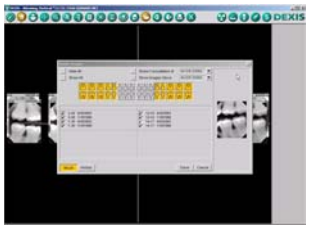
- Use the *Forward* button to “wind the tape” to the end before recording. This will append the new recording to the end of the existing recording.
- Start recording to insert the newer recording before the existing recording.
- Erase the existing recording and begin again.

5.5.6 THE IMAGE ARCHIVE

The *Archive* icon allows access to the patient’s entire image history. Equate this feature to searching through a patient’s chart to choose which films are to be placed on the view box for the current procedure. To “file” an image or to place it in the archive, close a standard-sized image using the “x” or drag it to the icon and a box will open asking you to *Archive or Delete*. Choose *Archive* and the image will be placed in the archive.

A light under the icon signals that there are hidden images. Access them by clicking on the icon.

Archive Screen Overview



Click on the *Archive* icon or type “H” for a “history” of images for the patient in order to open the *Visible Images* screen.

Visible Images refers to the images that are currently visible on the screen. Again, this may be changed for every patient and every procedure.

All images are listed in the center area by tooth numbers and dates. A small selection box is located next to each. This part of the screen is set up in quadrants-UR, UL, LR, LL and bitewing area in the center.

There is also an area that resembles a tooth chart. Teeth in gold with a black outline have images that are visible on the current X-ray screen. Teeth in gray with a gold outline have images that are currently archived or hidden

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so they are not visible on the current X-ray screen. Teeth in gray with a black outline have no images.

Choosing Visible Images

You may choose to hide all the images by clicking the *Hide All* button in the upper left of the screen or to show all the images by clicking on the *Show All* button.

You may pick images taken **on** a certain date by using the drop down arrow next to *Show Consultation of* and clicking on the desired date. You may pick images taken **since** a certain date by using the drop down arrow next to *Show Images since* and clicking on the desired date. When the date(s) are chosen, the image selection buttons for those specific images are checked.

You may click on the image selection box to select and deselect individual images. For help in identification, when the cursor moves over an image selection box, a preview of that image will appear in the *Preview Panel*, on the right of the Archive dialog. You may also use the arrow keys to scroll for previews.

In addition, you may click on the actual image on the X-ray screen to select or deselect the image.For help in identification, the selected image on the X-ray screen has its box highlighted in Archive.

To view your selected images in a mounted format, click on the *Mouth* button on the lower left of the screen. If you want to view your selected images in chronological order, choose the *History* button. The *History* view is helpful when performing a procedure for one tooth or area, such as endodontics. Once this view is chosen and you return to the X-ray screen, all captured images will also appear in chronological order.

After making your selections, click *Done* to see only the requested images in the requested view.

DEXray allows you to see all images for a certain tooth or area from different dates. For example, if a patient has pain on tooth #1, open *Archive*, click on *Hide all* and click *tooth #1* on the tooth chart. Next, choose the desired view and then *Done*. All images that include tooth #1 will appear on the screen in the view you selected.

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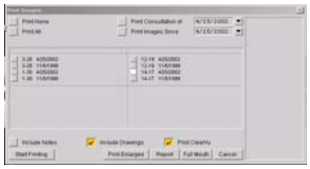
5.5.7 COMMUNICATIONS: PRINTING FROM DEXRAY OR DEXIMAGE

Before printing from DEXray, please verify that your printer functions outside DEXIS.

Please note: For optimal results images should be enhanced prior to printing.

Click on the *Print* icon, or type "P" on your keyboard, to open the Windows Print Dialog. This dialog allows you to select a different printer and to access the printer settings. You may also open the Windows Print menu by dragging an image to the Print icon.

Print Dialog Overview



From the Windows Print dialog, choose *OK* to open the DEXIS Print Dialog. You will notice that this screen is similar to the Archive screen. All visible images are listed in the center section by tooth numbers and dates. A small selection box is located next to each. In addition, this part of the screen is set up in quadrants-UR, UL, LR, LL and bitewing area in the center.

You may *select none* or *all* images for printing. You may choose images taken **on** a certain date by using the drop down arrow next to *Print Consultation of*, and clicking on the desired date. You may choose images taken **since** certain date by using the drop down arrow next to *Print Images since* and clicking on the desired date.

When the date(s) are chosen, the image selection boxes for those specific images are checked.

You may click on the image selection box to select and deselect the images for print. For help in identification, when the cursor moves over an image selection box, a preview of that image will appear in the *Preview Panel*, on the right of the Print dialog.

In addition, you may click on the actual image on the X-ray screen to select and deselect the image for print.For help in identification, the selected image on the X-ray screen has its box highlighted.

When you are finished selecting the images, choose to print the image with the notes attached to it and/or print in ClearVu.

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Choose a Print Format

- *Start Printing* for 6 images per page
- *Print Enlarged* for 2 images per page
- *Full Mouth* to print images in landscape or horizontally on the paper similar to a full mouth mount
- *Report* to add the images to the standard report. The text of the standard report can be modified in DEXIS Preferences; the text of an individual report can be modified before printing. In the report the referring dentist, patient, date, and provider information will be merged. Arrow down to change the text as needed; you are changing it for this patient only. Now, choose *Done* to start printing. Please remember, the letter will not be saved in DEXIS nor can you change font or layout. Only DEXwrite offers this feature, as well as other merging and format possibilities.

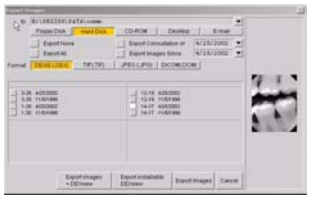
Once you choose one of these functions, the information will be sent to the printer.

Add to Printout will allow you to print additional images on the last page printed for this patient. This feature is for standard sized images given only with the *Start Printing* button. It can be used to add an intra-oral camera image to a previously printed intra-oral X-ray to the same page. After the initial print, insert the paper, choose your images and choose *Add to Printout*.

5.5.8 COMMUNICATIONS: EXPORT

Click on the *Export* icon or type "›" on your keyboard to open the *Export Images* screen. Alternatively, you may drag an image to the *Export* icon to open the *Export Images* screen.

Choose a Destination:



- *to:* The area to where images will transfer appears in a box on the upper left marked *to:*. You may type a destination folder into this box or use the down arrow to browse for a destination.
- *Floppy Disk* to copy images to a floppy disk
- *Hard Disk* to copy images within your own system

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- *CD-ROM* to send images to the Windows directory where images are staged for burning CD-ROMs electronically
- *Desktop* to send images to the Windows Desktop
- *E-mail* to send images electronically

Choose a Format

- *DEXIS* to move images within your own DEXIS system or to send to colleagues with DEXIS or DEXview.
- *TIFF (.TIF)* or *JPEG (.JPG)* to export images for use by other software programs. These formats are generally accepted by word processing and graphics software programs.
- *DICOM* is for colleagues who have DICOM-compliant software. DICOM is a universal digital format for medical and dental images. The image carries patient information and the date on which the image was taken. Dentists with DICOM-compliant software from different suppliers should be able to exchange X-rays along with the medical information attached to them.

Choose Images

You may choose to *Export None* or *All* images. You may choose images taken **on** a certain date by using the drop down arrow next to *Export Consultation of* and then clicking on the desired date. You may choose images taken **since** a certain date by using the drop down arrow next to *Export Images since* and then clicking on the desired date. When the date(s) are chosen, the image selection boxes for those specific images are automatically checked.

You may click on the image selection box to select and deselect the images for export. For help in identification, when the cursor moves over an image selection box, a preview of that image will appear in the *Preview Panel*, on the right of the Export dialog. You may also use the arrow keys to scroll for previews.

In addition, you may click on the actual image on the X-ray screen to select and deselect the image for export.

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When you drag an image to the Export icon, that image is automatically selected.

For help in identification, the selected image on the X-ray screen has its box highlighted in Export Images screen.

Send Images and/or DEXview:

- *Export images + DEXview* to export images and the DEXview program
- *Export installable DEXview* to export only the DEXview program for installation on a different computer
- *Export Images* to move images within your system, to send images to colleagues who use DEXIS or to send images to colleagues who have previously installed DEXview

Click *Cancel* to cancel the export process

Once you make your selection and the export is accomplished, the *Export Images* screen will close.

5.5.9 MORE ON EXPORTING

Move Images to the Correct Patient

The Export function may be used to move an image that was taken on the wrong patient's screen. By choosing *Hard Disk*, selecting images and then choosing *Export Images*, the images move to the *DEXIS Communication Folder* ready to be imported into the correct patient's screen, see "Communications: Import" on page 86.

Please note: These images are not removed from the incorrect file; they are simply copied. The images will need to be deleted from the incorrect file.

Send a Set of X-Rays on Removeable Media

To send a set of X-rays to a colleague who does not have DEXIS, choose *Floppy Disk* or *CD-ROM* and *DEXIS format* and then select the desired images. Now choose to *Export Images + DEXview*, to send the images with DEXview. Your colleague simply needs to open the disk and double-click on DEXview to view the images.

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E-Mail Images

Choose *E-mail* and the appropriate format and then select images. Either add the recipient's e-mail address to the "to" field behind the "›" sign, or add it later to the message in your e-mail program. Now, choose *Export Installable DEXview* to send only the viewer, or *Export Images* to send only the images. For security reasons you may not send images and DEXview together. Once the screen closes, your e-mail program will open with a new message created with the X-rays attached. Send the message as you would any other e-mail message.

Place Images Directly Into Word Processing Programs

There are two ways to copy an image to a word-processing program such as Word or WordPerfect on into other programs accepting images such as PowerPoint.

- Enlarge and enhance the desired image. Next, hold down the *Control* key and type the "C" key. Now, open your word-processing program and hold down the *Control* key and type the "V" key or use the *Paste* icon. The image will appear on the document ready for sizing.
- Enlarge and enhance the desired image. Hold the *Control* key down and drag and drop the image into another application (e.g. a Word or PowerPoint page).

In either case, the image will retain its current shape and enhancement.

DEXview

DEXview is a helpful program that allows your colleagues to view, enhance and save DEXIS images without installing the full DEXIS program. DEXview runs on any Windows computer. You may freely distribute DEXview. Two packagings are available:

You can export *Images + DEXview* onto a disk. The receiving dentist opens the disk by double-clicking on *My Computer*, then double-clicking on the appropriate drive. She/he then opens DEXview by double-clicking on it. DEXview will show the images on the disk.

You can send *Installable DEXview* by disk or e-mail. This is a SETUP program which, when executed, installs DEXview as the software for opening DEXIS images with the file extension .DEX. After DEXview has been installed, your

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colleagues can open any DEXIS image files by double-clicking on them. DEXview will open and show the images. Once your colleague installs DEXview, you need only send images.

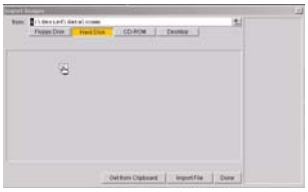
Now, each time an image file is opened, your colleague will be able to view the image, use ClearVu, change the contrast using click and drag, use *Home*, *Rotate*, *Mirror* image. Use the arrows to scroll through the images on the disk.

Information such as implants, alerts, and graphic objects display. Click on an object to display its attached text. All objects can be hidden by clicking the *Notes* icon.

In addition, the images may be saved to a file in various formats by using the *Export* icon. Please let your colleagues know that Tooltip is available for help throughout the screen.

5.5.10 COMMUNICATIONS: IMPORT

Click on the *Import* icon or type "‹" on your keyboard to open the *Import Images* screen.



Choose a Source

- *Floppy Disk* to import images from a floppy disk
- *Hard Disk* to import images within your own system, typically from the DEXIS Communication Folder
- *CD-ROM* selects images on the first installed CD-ROM drive
- *Desktop* selects images on the Windows Desktop
- *From:* The area from where images will transfer appears in a box on the upper left marked *from:*. You may change the location by typing; go one level up by clicking the up-arrow button to the right; or select a subfolder from the list below.

Images contained in the selected folder are listed: file name; patient name; tooth number(s), if applicable; date; note attached to the image, if applicable.

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For help in identification, when an image is selected, a preview of that image will appear in the *Preview Panel*, on the right of the Import dialog. You may also use the arrow keys to scroll for previews.

To import the file, click on the desired file and click on *Import File*, double-click on the file or arrow to the file and hit the *Enter* key.

Continue importing image files using the same process. Imported files will disappear from the list. When you have imported all desired files, click *Done* to close the Import dialog box. The images will now appear on the patient's screen.

Please note: If importing an image with a different patient name, you will receive a warning message and will need to choose *Yes* to import or *No* to cancel the process.

Get from Clipboard

After the desired image is placed onto the Windows Clipboard from another program, open the patient's screen and the *Import Images* screen. Click on the *Get from Clipboard* button and click *Done*. This image will now appear on the patient's screen.

5.5.11 MORE ON IMPORTING

Import from Patient's Screen

If you know the patient's name whose images are stored on a disk, select the patient's proper screen, insert the disk into the appropriate drive and import that patient's images following the import directions as described in the previous section.

Import from Outside DEXIS

Open a disk containing images outside DEXIS. Or, open an e-mail attachment of an image.

After opening an image in DEXview you may send it to DEXIS by clicking on the *Export* icon on the DEXview screen. Scroll through the images using the arrows and export all desired images in this manner.

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Now, open DEXIS Administration. Click on the *Import* icon. This icon will only be visible if images are waiting to be imported. Highlight an image and click on *Select Patient*. DEXIS will choose a patient with the same name or, if none is found, will open a new *Patient Data* screen. Add the appropriate information and click *Done* to save.

If a new *Patient Data* screen appears but you wish to choose a patient on record, click *Cancel* to return to the patient list.

Proceed to the patient's screen and import the images as previously described. Only images appropriate to that particular screen will appear for import.

Please note: The Import screen will automatically open should there be any outstanding image of the selected patient stored in the communication folder or in the folder used for temporary storage of newly acquired images. See "Import from Communication Folder or from Temporary Folder" on page 45 for more details.

5.5.12 The Compare Function

Compare allows for the comparison of two images either side-by-side or overlaid in different modes to ascertain their differences. It was designed in response to requests from the research community; however, all DEXIS owners have the opportunity to use this function.

Select your first image, usually the newer of the two. Click *Compare* in the Navigator box (see "The Navigator" on page 58) to open the *X-ray Comparison* box. The software will show the selected image and an older one of the same tooth next to each other. The Comparison box gives you the choice to select a different image to compare to by listing all images of the same tooth and *Other*. When you selected *Other* or there is no image with the same tooth number, you will be asked to choose your second image by clicking on it. You can now select one of the four comparison tools: *Show Side-by-Side*, *Colored Addition*, *Subtraction*, *Red-Green Stereo*.

Show Side-by-Side

This is the default mode. It shows the two images next to each other and proportional in size.

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Choose one of the remaining tools, and the images are overlaid with the selected tool applied.

Aligning Images

Since two images will rarely be captured using the exact same angle or position, it will be necessary to align the two using the following methods – the active function will be shown through the shape of the mouse cursor:

Click and drag in the center of the image to reposition the entire second image on top of the first.

Stretch the second image horizontally by clicking and dragging on the side or vertical margins of the image.

Stretch the second image vertically by clicking and dragging on the top or bottom or horizontal margins of the image.

Rotate the second image by clicking and dragging in a corner of the image.

Alternatively, you may use the "+", "–", and "o" buttons in the upper part of the X-ray Comparison box:

Horizontal Shift: move the second image to the left (-) or right (+).

Vertical Shift: move the second image to down (-) and up (+).

Rotation: rotate the second image counter-clockwise (-) or clockwise (+).

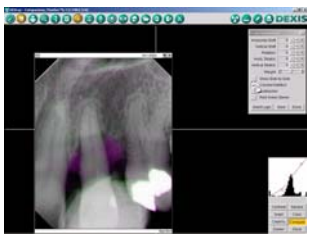
Horizontal Stretch: shrink (-) or stretch (+) the second image horizontally.

Vertical Stretch: shrink (-) or stretch (+) the second image vertically.

Click on the "o" to return the function to the original value.

The *Weight* tool shifts the appearance of one image over the other.

Colored Addition



The goal of *Colored Addition* is to have areas of common density appear gray and the non-common areas in green or magenta. The color areas are changes in density from the first X-ray to the next.

Once your images are aligned, use the *Weight* scale if necessary. By moving the sliding bar to the left the second image (in green) becomes more visible or has more *weight*. Move the bar to the right and the first image (in magen-

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ta) becomes more visible or has more *weight*. By moving the bar to balance the weight, gray areas (common densities) appear.

On the combined, aligned image, magenta areas are areas of greater density on the first image while green areas are areas of greater density on the second image.

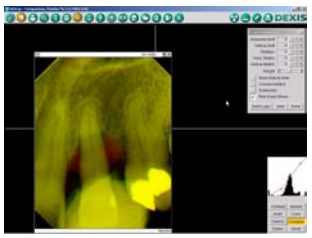
Subtraction

The goal of Subtraction is to have areas of common density appear gray and the non-common areas in light or dark. The light and dark areas are changes in density from the first X-ray to the next.

Once your images are aligned, use the *Weight* scale if necessary. By moving the sliding bar to the left the second image (in green) becomes more visible or has more *weight*. Move the bar to the right and the first image (in magenta) becomes more visible or has more *weight*. By moving the bar to balance the weight, gray areas (common densities) appear. The second image is subtracted from the first one, which means that if you give more weight to the second one, the resulting image will appear negative.

On the combined, aligned image, lighter areas are areas of greater density on the first image and darker areas are areas of greater density on the second image.

Stereo



The goal of *Stereo* is to achieve a 3-D appearance. Choose two images for the same area that were taken at slightly different angles (8 degrees or less). When viewed with 3-D glasses (red-green lenses), the combined image appears in 3-D. The Weight tool can also be used to enhance the 3-D image.

Invert Logic

Use *Invert Logic* to reverse the properties of the compared images; i.e., have the second image take over the role of the first one and vice versa.

Save

You may save the combined images as an additional image by choosing *Save*. The new image will have the current date and the parameter “Com-

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parison: (date of first image) vs. (date of second image)" When using *Color Addition* and *Stereo* the saved, combined images will appear on the X-ray screen and print in color. The security bar will show *Derived*.

5.6 X-Ray Image Security

Beginning with video imaging, there has always been a concern about the medical/legal aspects of the image. Can the image be altered? And if so, will it be acceptable in a court of law?

It is common knowledge that any form of digital image can be changed in a commonly available image-processing program. However, DEXIS images have a built-in Digital Signature feature. When an X-ray is captured and stored to disk, a code is computed from the image using encryption methods. This "digital signature" is stored together with the image and compared when the image is loaded. Three cases are distinguished and displayed:

1. The digital signature matches the image contents. The image is labeled *Original*.
2. The digital signature does not match the image contents. The image has been tampered with; it will be labeled *Modified*.
3. There is no digital signature present. The image has been imported into DEXIS from elsewhere. The software cannot decide whether it is original or modified. This image will be labeled *Imported*.

5.7 Working with Panoramic and Cephalometric Images

DEXIS allows for the capture and storage of panoramic and cephalometric images in the Extra-oral DEXray screen. You may digitally capture images, see "DEXpan" on page 161, or scan standard film, see "DEXscan: Scanned Images" on page 109 in order to place them into this screen. Once there, images are available for use with the Image Management Tools.

Please refer to the Image Management Tools for the Intra-oral screen section ("Image Management Tools" on page 55). Since the majority of the icons and functions are the same for both screens, only the differences are listed here:

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There is not a *Canal* function (or related functions) under *Measurement*.

Since all images are displayed in chronological order, there isn't a choice of *Mouth* or *History* view in *Archive*.

The X-ray capture button functions only if digital panoramic equipment is installed or if *Simulation* is chosen in *DEXray Preferences*.

Due of the size and shape of panoramic and cephalometric images, the images always print in landscape when *Start Printing*, *Print Enlarged*, or *Full Mouth* is chosen. *Diagnosis* and *ClearVu* are options. *Add to Printout* and *Report* are not available.

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Chapter 6

DEXimage: Photographic Images

The DEXimage program is the main software application for acquiring, storing, displaying, and sharing *light-based* digital photographic images.

DEXimage is an important adjunct program to the DEXray program. Simply stated, DEXimage is to light-based images what DEXray is to X-ray images.

DEXimage works with two principal types of photographic equipment: *Extra-oral Digital Cameras* and *Intra-oral Video Cameras* and variations thereof. DEXimage displays both still and video images in both color and monochrome, although only still images may be stored on the computer's hard drive.

Like DEXray, DEXimage is also a sophisticated piece of software that has been carefully designed and developed to be easy and quick to learn and intuitively easy to use. Icons and function buttons enable the user to move, size, enhance, measure, save, and compare images with just a click and/or drag of the mouse.

6.1 DEXimage Screen Overview

You may open DEXimage from the DEXIS Administration screen or a patient's DEXray screen by clicking on the *DEXimage* icon on either screen. Practice management programs may contain a direct link to DEXimage, but typically you need to access DEXimage through DEXray if you are linked.

You may apply certain Windows functions to this screen. You may size the screen using click-and-drag. You may also use the three buttons in the upper right to minimize the screen (thus sending it to the task bar – click the tab to bring it back up), maximize or restore a screen, or close a screen. For

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more information on screen sizing and multiple screens, see “Screen and Window Adjustments” on page 159.

The patient information is shown in the header bar; function icons are located across the top of the main window. Place your cursor on any of the icons and buttons and a help bubble, called a *Tooltip*, appears with information about the function. Often, there is also a keystroke that will execute the function. The Tooltip help feature is available throughout the DEXIS system. Many of the functions in DEXimage are equivalent to the corresponding functions in the DEXray program. In these cases we will refer to their description in the DEXray chapter.

The DEXIS Logo icon gives access to program information, *Preferences*, *Help*, and the *DEXIS Web Site*.

On the right of the DEXimage screen, is the *Presentation Panel*.

Like DEXray, DEXimage contains separate screens for intra-oral images that may be positioned according to tooth numbers, and for extra-oral images that do not require tooth numbers. In contrast to DEXray, you may decide to place all your photographic images on the extra-oral screen by setting the default accordingly. If you do that, all images will be placed in chronological order, and you need not give tooth numbers to your intra-oral images.

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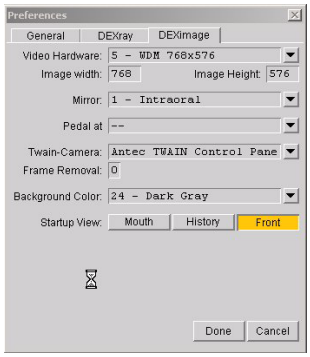
6.2 SETTING DEXIMAGE PREFERENCES

You may access the DEXimage preferences in two ways:

- From DEXIS Administration, click on the *Wrench* icon to open *Tools and Preferences*; click on the *DEXimage* tab to select DEXimage Preferences.
- From a patient's DEXimage screen, click on the DEXIS logo to open the *Program Information* screen; select *Preferences*, click on the *DEXimage* tab to select DEXimage Preferences.

Video Hardware



You may select which interface to use for your video capture card and which size the live video image should have. The best choice is usually *WDM Full Screen*, which uses the WDM interface and shows the live video image filling the entire screen. On some Windows 95 systems, this choice might not work, and you might have to select any of the *VfW* settings. If you use *VfW*, the window size has to match the size of the live video set in the capture card's driver. See also "Hardware Installation" on page 12. Choose *No Board* for workstations where video images will not be taken. You may also choose *Simulation* to have DEXimage simulate taking video images.

The fields *Image Width* and *Image Height* contain the size of the window for the live video image. You may modify the size if none of the proposed sizes fits your needs. If *Image Width* or *Image Height* is set to zero, full screen format is assumed.

Mirror

Use the *Mirror* setting to compensate should your camera capture in reverse. A simple test: Capture an image of printed material. If the print appears backwards, then all captured images will be reversed.

Choose:

- *Never* to have images on intra-oral and extra-oral screens never reverse
- *Intra-oral* to have images captured on the intra-oral screen be reversed
- *Extra-oral* to have only images captured on the extra-oral screen only reversed
- *Always* to have images on intra-oral and extra-oral screen always reverse

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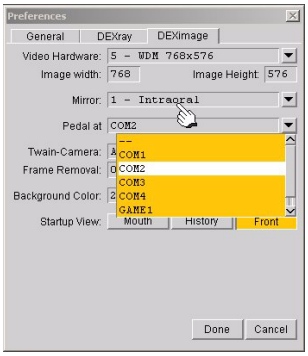
Please note: You are choosing a default setting. You will have the option to change *Mirror* in the *Live Video* screen and on the actual DEXimage screen for any given picture as well.

Pedal



If you use a foot pedal or another external switch, choose the appropriate port. Footpedals may be connected to a serial port or to a game port. Choose "--" for no external switch. Also see "Hardware Installation" on page 12.

Twain Camera

Click on the down arrow to select from the list of installed digital cameras and scanners using the Twain interface. Though still image acquisition in DEXimage usually uses a camera, you may also select a scanner here. If you do not acquire pictures from a digital camera or scanner, or if your camera pictures are transferred through memory cards, select "--."

Please note: Most digital cameras do not have Twain drivers but use memory cards which are shown as drives in Windows Explorer, when the camera or card reader is connected. In this case set Twain Camera to "--."

Frame Removal

If your scanner or digital camera produces unused edges or frames, you may set this entry to a value between 1 and 6. Start with 1 and increase the value until the frame is removed. You need to select the camera or scanner before setting this value.

Background Color

Click on the down arrow to choose a background color for the main window.

Startup View

Select the view you want to be initially visible when DEXimage opens for a new patient: *Mouth* refers to intra-oral images in the mounted view; *History* refers to intra-oral images in chronological order; and *Front* refers to extra-oral or facial images. You have the option to change the view for each patient, see "The Image Archive" on page 79.

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Once you have made your selections, choose *Done* to save changes or *Cancel* to cancel changes.

6.3 Taking Digital Photographs

The *Camera* icon on the DEXimage screen is used to acquire digital photographs from a still image digital camera or from a scanner.

There are two paths to acquire photographs from a digital camera; which one you use depends on the camera model.

Most modern digital cameras store images on memory cards. The pictures are transferred to the computer through a card reader that allows the memory card to appear as a disk drive. Card readers may be connected via USB or have adapters that fit into the PC Card slot. Some cameras have built-in card readers that support the same path.

Some cameras and practically all scanners support the Twain interface, which allows applications to launch the camera/scanner software and request pictures from it.

Please note: Before attempting to use your digital camera with DEXIS, please install your camera's software (if applicable) and test its function outside DEXIS, see "Installation Verification and Testing" on page 147.

6.3.1 Memory Card with Card Reader

Choose your patient and open DEXimage. Verify that the Digital Camera is set to "--" in DEXimage Preferences.

Insert the memory card into the reader or connect the camera if it has a built-in reader.

Click on the *Camera* icon to open the *Picture Acquisition* box to view the images stored on your memory card. Click on the picture. You may now *Rotate*

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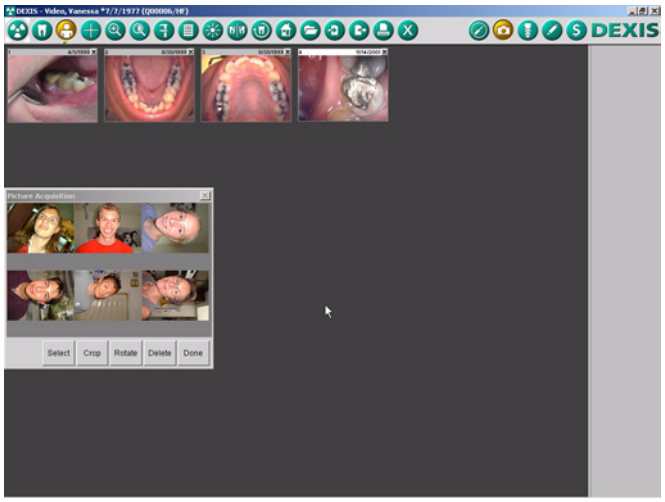
or *Crop* the picture before choosing *Select* or dragging it to the DEXimage screen. You may also *Delete* the picture from the memory card.



If a picture is to be placed onto the intra-oral screen, you will be prompted to assign a tooth number.

6.3.2 TWAIN INTERFACE

Choose your patient and open DEXimage. Verify that the digital camera is set to the model you use in *DEXimage Preferences*. This may be a Twain compatible camera or a scanner. Connect your camera or scanner.

Click on the *Camera* icon to open your camera/scanner software. In the case of a digital camera, it will show you thumbnails for all images stored in the camera and you can select from them. When you close the scanner/camera software the selected images will be shown in *Picture Acquisition* box. Click on a picture. You may now *Rotate* or *Crop* the picture before choosing *Select* or dragging it to the DEXimage screen.

If a picture is placed onto the intra-oral screen, you will be prompted to assign a tooth number.

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6.3.3 PATIENT PICTURE

You may acquire a patient's picture on one of the paths as described above to be shown on the DEXIS Administration screen once the patient is selected. When in place, this picture becomes a helpful identifier and is also an image option in DEXwrite. To acquire a patient's picture, click on the *New Picture* button on the patient's *Patient Data* screen (from DEXIS Administration) to open the *Picture Acquisition* box.

6.4 TAKING INTRA-ORAL VIDEO IMAGES

To capture images from Live Video with devices such as an intra-oral or microscopic camera, you must choose the setting for your video capture card. The choices appear in *DEXimage Preferences*. See "Video Hardware" on page 95. Verify that your camera is on, click again on the *Wand* icon or type "v" (for video) on your keyboard to open the *Live Video* screen. The camera's live video will appear.

6.4.1 ADDITIONAL SETTINGS

If the live video does not appear or is of poor quality, click on the *Wrench* icon in the upper right corner to open the adjustments screen of your video capture hardware. The options may vary depending on the capture card and its driver.

Important settings are:

The *Video Source* needs to be set to the connector your camera is connected to, usually either *Composite* or *S-Video*.

The *Video Standard* needs to be set to the standard of the camera, usually *NTSC* in the US.

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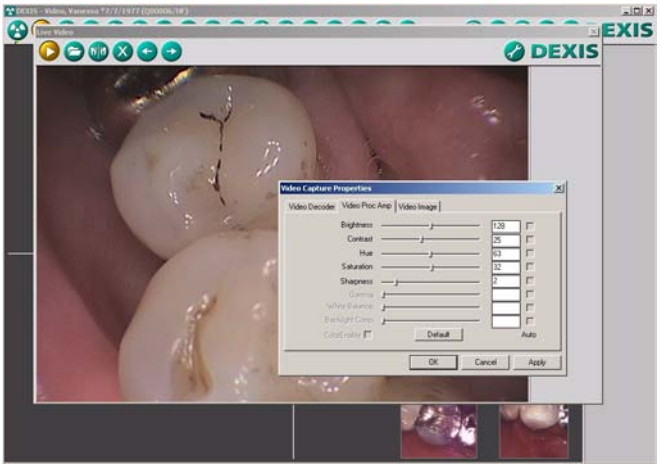
The *Video Format* should be set to *Full*. It needs to be reduced to *Half* if the full format causes speed issues or other problems.



6.4.2 CAPTURING IMAGES

Left-click on the *Stop* icon or anywhere outside the icons to freeze an image. Left-click again to return to live video. Once the image is satisfactory, click on the *Archive* icon or right-click anywhere outside the icons to save it.

You may also use the space bar to start and stop the video, the "T" key (for *take*) to save the image, or the arrow keys to scroll through the icons, hitting *Enter* to initiate their function.

As you acquire an image, it will appear as a thumbnail on the *Preview Panel*. Click on the individual thumbnail, or scroll with the arrow keys, to enlarge. You may also use the *Space* and *Enter* keys to enlarge or reduce

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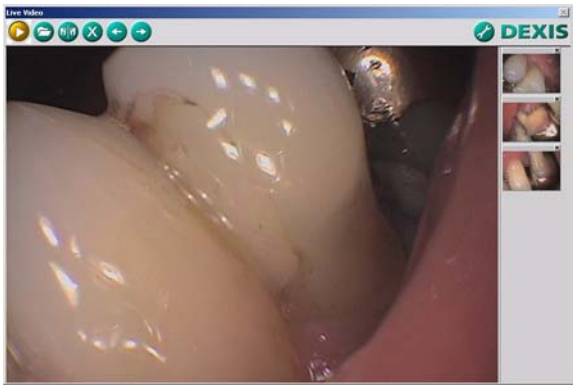
respectively. You may delete an image by clicking on the “x” in the upper right corner or by hitting the *Delete* key when the thumbnail is highlighted.



If your camera captures images flipped, use the *Mirror* icon (or press “U” for U-turn) to correct. You may also flip the image when back on the DEXimage screen. Alternatively, you may change the default setting in *DEXimage Preferences*, see “Mirror” on page 95.

Exit with the “X” icon or hit “Q.” The captured images will appear on the DEXimage screen.

When capturing images on the intra-oral screen, you will be asked to choose tooth numbers for captured images.

If the capturing software is set to any of the *WDM* modes (e.g. *WDM Fullscreen*, see “Video Hardware” on page 95), the software continuously captures video frames while the live video is running. When you stop the live video, you may browse through the last 10 frames and select the best one by clicking the *Previous* or *Next* button.

Please note: The frame browsing feature is only available when in WDM mode.

6.4.3 SIMULATION MODE

DEXimage has sample images within the program that can be captured, thus simulating the process of camera image capture. To capture the sam-

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ple images, open *DEXimage Preferences* and choose *Simulation* under *Video Hardware*, see “Video Hardware” on page 95.

Upon returning to the DEXimage screen, open the *Live Video* screen. Since there is no camera attached to your computer, you will not see any live video. However, as with live video, click on the file icon to *Save* the simulated images.

Exit with the “X” icon. The simulated images will appear on the DEXimage screen.

6.4.4 Foot Pedal or Wand Capture

DEXimage supports foot pedals connected to the serial or game port. Presence of a foot pedal and the port number need to be set in *DEXimage Preferences*, see “Pedal” on page 96. Some intra-oral cameras have buttons to start, stop and capture images. Ask DEXIS tech support if these buttons are supported.

Foot pedal capture: Quickly step down once to freeze the video. Step down again to restart it. Having frozen the video, you can step down again and hold the pedal for about 1 second to save the image.

Wand capture (if supported): Press down on the capture button on the wand to freeze the video. Press it again to restart. Having frozen the video, double-click the capture button to save the image.

Quad Feature

If your camera has a quad feature, please be aware that the four images will appear as one on the DEXimage screen. Since you may assign tooth numbers to images, we suggest that you turn off the quad feature.

6.5 Image Management Tools

You may control all functions in the DEXIS software by mouse-click or keyboard, whichever is more convenient for you. The Tooltip bubbles will give a short description and keystroke of each item. There is a complete listing of keystrokes in “Keyboard Use and Shortcuts” on page 153.

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Many of the functions in DEXimage are equivalent to the corresponding functions in the DEXray program. In these cases we will refer to their descriptions in the DEXray chapter.

6.5.1 Selection and Navigation

See DEXray, "Selection and Navigation" on page 55.

6.5.2 DEXimage Screen Icons

An icon will turn gold when initiated. For example, the "tooth" icon is highlighted when on the intra-oral screen. When a function icon is chosen or the appropriate key typed on the keyboard, the selected image will automatically enlarge and the function box will open next to the image. In addition, many icons will allow you to drag an image to them thereby opening their function. Click again on the icon or corresponding keystroke to terminate its function.

DEXIS will apply the current function to another image once you click on that image. There is no need to close the current function and image in order to begin working with a newly chosen image.

Please remember that the Tooltip is available for help. The corresponding keystroke will show in the help bubble.

DEXray Icon

The *DEXray* icon leads to DEXray where X-ray images are captured, stored and managed. Click on the icon or type "X" (for X-ray) to initiate its function.

A light under the icon signals that there are images for this patient in DEXray.

Intra-oral and Extra-oral Icons

By clicking on the *Intra-oral* or *Tooth* icon or by typing "A" (for access) you switch to the intra-oral screen.

The *Extra-oral* or *Head* icon leads to a patient's extra-oral images screen. Click on this icon or type "F" (for facial) to move to this screen.

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A light under an icon signals that there are images for this patient in the corresponding section.

If you drag an image to one of these icons, it will be moved to the corresponding screen.

Overview Icon

Click on the *Overview* icon to see all four DEXIS screens (DEXray intra-oral and extra-oral, DEXimage intra-oral and extra-oral) for this patient. See DEXray:"Overview Icon" on page 61 for details.

Zoom Icon

Use the *Zoom* or *Magnifier* icon to magnify a portion of the selected image. You may also type "Z" (for zoom) to initiate its function.

The portion visible in the *bird's eye frame* can be changed by clicking to a different spot or by holding down the left mouse button and moving to another area on the image. The *bird's eye frame* is closed when the Magnifier function or the the selected image is closed.

To magnify the entire image, see "Full Screen View" on page 56. Once in Full Screen mode, the *bird's eye frame* remains in function, magnifying the already magnified image by another step.

Spotlight Icon

This icon allows you to show an area of the image in maximized contrast. Using the Spotlight cursor, click on the desired area and hold the left mouse button to view the desired section of the image.

Measurement Icon

The Measurement tool is primarily used for endodontic and implant measuring on X-rays, although distances on photographic images may be measured if the image shows objects of known size which may be used for calibration. See "Calibrated Measurement" on page 73.

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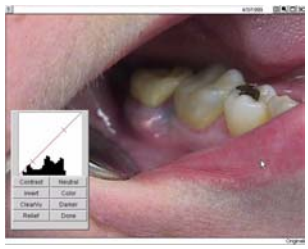
Notes Icon

This icon will allow you to attach text (notes, diagnoses or comments), drawings (free-hand and polygons), and voice notes to an image. See “Image Annotations” on page 76.

Enhancement Icon

Click on the *Enhancement* icon or type “E” to open the *Image Enhancement* box to adjust brightness and contrast of the selected image.

The top of the Enhancement dialog box shows a histogram of the selected image and a curve showing the current contrast and brightness setting. You may manipulate this line by clicking and dragging at the two crosses.



The functions *Contrast*, *Neutral*, and *Invert* can operate on color images and on grayscale images (X-rays). The functions *Color*, *ClearVu*, and *Relief* only work on grayscale images (X-rays). See DEXray: “Image Enhancement” on page 66 for details.

Mirror Icon

Click the *Mirror* icon or type “U” (for U-turn) on your keyboard to flip the image horizontally or *mirror* your image. Alternatively, you may drag an image to this icon to mirror it.

Rotate Icon

The image (standard and enlarged) may be rotated using the *Rotate* icon. You can also type “R” on your keyboard or drag the image to the icon to rotate it in 90-degree increments.

Home Icon

The *Home* function is activated by clicking on the *Home* icon, by typing “B” (for back) on your keyboard or by dragging the image to the icon. See DEXray “Home Icon” on page 64.

Archive Icon

The *Archive* icon allows access to the patient’s entire image history. See DEXray “The Image Archive” on page 79.

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Import Icon

Click on the *Import* icon or type "‹" on your keyboard to open the *Import Images* screen. See DEXray "Communications: Import" on page 86.

Export Icon

Click on the *Export* icon or type "›" on your keyboard to open the *Export Images* screen. Alternatively, you may drag an image to the *Export* icon to open the *Export Images* screen. See DEXray "Communications: Export" on page 82.

Print Icon

Click on the *Print* icon, or type "P" on your keyboard to open the Windows Print Dialog. This dialog allows you to select a different printer and to access the printer settings. You may also open the Windows Print menu by dragging an image to the *Print* icon. From the Windows Print dialog, choose *OK* to open the DEXIS Print Dialog. See "Communications: Printing from DEXray or DEXimage" on page 81.

Quit Icon

Click on the *Quit* icon, type "Q" on your keyboard, or click on the "x" in the upper right corner of the screen to leave the patient's DEXimage screen.

Wand Icon

Click on the *Wand* icon, or type "V" (for video) on your keyboard to open the *Live Video* screen in preparation for capturing images with an intra-oral or microscopic camera. See "Taking Intra-oral Video Images" on page 99.

Camera Icon

Click on the *Camera* icon or type "C" on your keyboard to load images from your digital camera, see "Taking Digital Photographs" on page 97. You may also use this icon to open the scanner software to scan a picture into DEXimage.

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DEXimplant Icon

Click on the *DEXimplant* icon or type “N” to open DEXimplant. See “DEXimplant: Implant Planning and Monitoring” on page 117.

DEXwrite Icon

Click on the *DEXwrite* icon or type “W” on your keyboard to open the DEXwrite program, see “DEXwrite: Chairside Report Generator” on page 123.

DEXclaim Icon

Click on the *DEXclaim* icon or type “L” on your keyboard to open the DEXclaim program for the selected patient, see “DEXclaim: Images as Claim Attachments” on page 141.

Please note: DEXclaim is only applicable for dentists residing in the USA.

DEXIS Logo Icon

Click on the DEXIS Logo icon or click “I” on your keyboard to obtain program information, the *Preferences* button and these two additional features:

Help: Click on this button and your cursor gains a “?” Now, click on an item on the DEXimage screen and the manual will open in Acrobat Reader to the page that describes that item’s function.

DEXIS Web Site: Click on this button to open the DEXIS web site in your browser.

Click *OK* to close the Program Information screen.

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Chapter 7

DEXscan: Scanned Images

The DEXscan program is an important software application for scanning film- or paper-based X-ray and Photographic images.

DEXscan is an invaluable tool for incorporating historic images or images supplied from another source into either DEXray or DEXimage. Most commonly, it is used by offices wishing to convert their historic film-based patient X-rays (both intra-oral and extra-oral) into a digital format for comparison with later X-ray images.

A particularly special feature of DEXscan when scanning intra-oral X-rays is the ability to place many X-ray films on a flatbed scanner; the software will separate them automatically and will optionally assign tooth numbers based on the position of the film on the scanner.

7.1 Scanning X-Ray Films

DEXscan owners may scan standard intra-oral and extra-oral films into DEXray. Once the film becomes a digital image, it is available for Image Management Tool functions. This includes the ability to print them instead of copying them with duplicating film and traditional processing with chemicals.

Although your scanned images will not have the same high resolution as images captured with your DEXIS sensor, they will be available for tool bar use.

Please note: Before attempting to scan, please verify that your scanner meets the DEXIS systems requirements, see “Hardware Requirements” on page 8. In addition, verify that your scanner’s software is installed, and test its function outside DEXIS. You must have a transparency adapter to scan X-ray film.

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7.1.1 INTRA-ORAL WITH FLATBED SCANNER

Open a patient's DEXray intra-oral screen. Open *DEXray Preferences* and choose your scanner software under *Scanner*. Click *Done*.

Remove the films from the mount (if applicable) and place the intra-oral films on the scanner bed bubble side down.

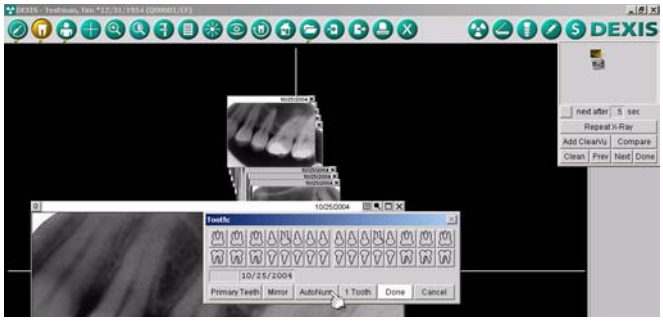
Leave a ¼ inch space between and around each film. DEXIS will "cut" around each film.

Click on the *Scanner* icon to open the scanner software.

When the scanner software opens, Choose the following settings: *Transmissive*, *Grayscale* or *B/W Photo*, *300 DPI* and *100%*. Depending on your particular scanner software, you may achieve better results using *RGB* or *Color Photo* instead of *Grayscale* setting. We encourage you to explore your scanner's options.

Click *Preview* to show the placement of the films on the scanner bed. Adjust the scan area, i.e., draw a box around the entire area to be scanned using click and drag. Again, allow ¼ inch around the outermost edges of the films. Click *Scan* to send the information to DEXray

When the scan is complete, the scanning software will close. One at a time, each image will appear along with the *Tooth* box. Assign a tooth number or numbers and a date (the actual date the film was taken) to each image. Once you select a date for one image, that date will be proposed for all subsequent images of the same scan..



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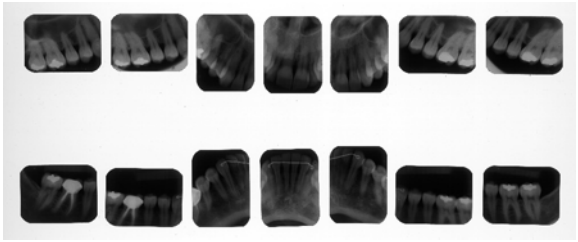
Automatic Assignment of Tooth Numbers

If you scan a series of X-rays (FMX or bitewing series), place the films on the scanner as you would like them to appear in mounted view on the screen. The rest position of the scanning bar should be at the top side or at the left side of the X-rays. Leave a ¼ inch space between and around each X-ray.



After having scanned the series and having cut out the individual images, the software will show the *Tooth Number* box. First, change the date, then click on *AutoNum*; the software will automatically assign tooth numbers based on the position of the film. If any tooth number is wrong due to inaccurate placement, you may correct that by enlarging the image, clicking on the tooth number and assigning the right one.

If you scanned several X-rays, all of the same tooth, you select the tooth in the *Tooth Number* box, then click on *1 Tooth* - the X-rays will all be assigned the same tooth number.

7.1.2 Intra-oral with Single-Film Scanner

If you want to use a single-film scanner to scan intra-oral X-rays one at a time you need to switch the automatic separation of X-rays off. Go to *DEXray Preferences*, select your scanner software under *Scanner* and then set *Frame Removal* to *1*, see “Frame Removal” on page 52

Open a patient’s DEXray intra-oral screen. Click on the *Scanner* icon to open the scanner software.

When the scanner software opens, choose the following settings: *Transmissive*, *Grayscale* or *B/W Photo*, *300 DPI*. Depending on your particular scanner software, in some cases you may achieve better results using *RGB* or *Color Photo* instead of *Grayscale* setting. We encourage you to explore

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your scanner's options. Insert the X-ray film into the scanner and start the scanning process.

When the scan is complete, the scanning software will close. The image will become visible along with the Tooth box. Assign a tooth number or numbers and a date (the actual date the film was taken).

7.1.3 EXTRA-ORAL

Open a patient's DEXray extra-oral screen. Open *DEXray Preferences* and choose your scanner software under *Scanner*. Click *Done*.

Click on the *Scanner* icon to open the scanner software.

When the scanner software opens, place the panoramic or cephalometric film face down on the scanner bed.

Choose the following settings: *Transmissive*, *Grayscale* or *B/W Photo*, *150 DPI* and *100%*. Depending on your particular scanner software, in some cases you may achieve better results using *RGB* or *Color Photo* instead of *Grayscale* setting. We encourage you to explore your scanner's options.

Click *Preview* to show the placement of the film on the scanner bed. Adjust the scan area, i.e., draw a box around the entire area to be scanned using click and drag. Click *Scan* to send the information to DEXray.

When the scan is complete, the scanner software will close. The film image will appear enlarged on the DEXray screen. Click on the number in the upper left corner to open the *Number/Date* box. Assign a date to the image.

7.2 SCANNING A PHOTOGRAPH

There are two areas where scanned photos are applicable: Patient picture found in Patient Data and DEXimage.

7.2.1 SCAN A PHOTO INTO DEXIMAGE

Photos can be scanned into DEXimage and stored there with captured or imported pictures. Once the film becomes a digital image, it is available for Image Management Tool functions.

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Please note: Before attempting to scan, please install your scanner's software and test its function outside DEXIS, see "Installation Verification and Testing" on page 147.

Choose your patient and open DEXimage intra-oral or extra-oral screen, whichever is applicable. Now open *DEXimage Preferences* and choose your scanner software under *Twain Camera*; we are essentially using the scanner as a camera. Click *Done*.

Click on the *Camera* icon to open the scanner software.

When the scanner software opens, place the photo face down on the scanner bed. Choose the following settings: *Reflective*, *True Color*, *300 DPI* and *100%*.

Click *Preview* to show the placement of the photo on the scanner bed. Adjust the scan area, i.e., draw a box around the part of the photo to be sent to DEXIS using click and drag. Click *Scan* to send the information to DEXIS.

When the scan is complete, the scanning software will close and a *Picture Acquisition* box will appear.

Click on the picture. You may now Rotate or Crop the picture before choosing *Select* or dragging it to the DEXimage screen. You may also *Delete* the picture and begin again.

If a picture is scanned into the intra-oral screen, assign a tooth number or numbers once it appears on the DEXimage screen.

7.3 Scanning a Picture for Patient Data

A patient's picture appears on the DEXIS Administration screen. Once in place, this picture becomes a helpful identifier and is also an image option in DEXwrite. You may scan a patient's picture into DEXIS Patient Data without having any additional modules such as DEXwrite or DEXscan.

Please note: Before attempting to scan, please install your scanner's software and test its function outside DEXIS, see "Installation Verification and Testing" on page 147.

Open DEXIS Administration and click on the *Wrench* icon to open *Tools and Preferences*. Click on the *DEXimage* tab, then choose your scanner software

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under *Twain Camera*; we are essentially using the scanner as a camera. Click *Done*.

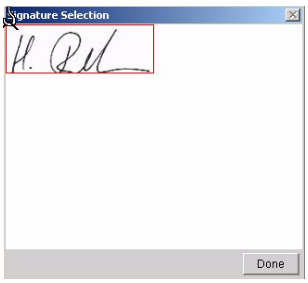
Click on the patient's name and then click on *Modify* to open the *Patient Data* screen. Click on the *New Picture* button to open the scanner software.

When the scanner software opens, place the photo face down on the scanner bed. Choose the following settings: *Reflective*, *True Color*, *300 DPI* and *100%*.

Click *Preview* to show the placement of the photo on the scanner bed. Adjust the scan area, i.e., draw a box around the part of the photo to be sent to DEXIS using click and drag. Click *Scan* to send the information to DEXIS. When the scan is complete, the scanning software will close and a *Picture Acquisition* box will appear.

Click on the picture. You may now *Rotate* or *Crop* the picture before choosing *Select* or dragging it to DEXIS Administration. You may also *Delete* the picture and begin again.

7.4 SCANNING A SIGNATURE OR LOGO



DEXwrite owners may scan signatures and logos into the system for use with DEXwrite letters.

Please note: Before attempting to scan, please install your scanner's software and test its function outside DEXIS, see "Installation Verification and Testing" on page 147.

Open DEXIS Administration and click on the *Wrench* icon to open *Tools and Preferences*. Click on the *DEXray* tab and choose your scanner software under *Scanner*. Then click on the *Administration* tab and select *Signatures* or *Logos*. The *Picture Acquisition* box will open and will show you the signatures/logos scanned so far. Click on *New* to open the scanner software and place the original signature or logo face down on the scanner bed. Choose the following settings: *Reflective*, *True Color* or *Color Photo* for color signatures and logos; *Grayscale* or *B/W Photo* for black and white signatures and logos, *300 DPI* and *100%*.

Click *Preview* to show the placement of the signature/logo on the scanner bed. Adjust the scan area, i.e., draw a box around the part to be sent to DEXIS using click and drag. Click *Scan* to send the information to DEXIS. When

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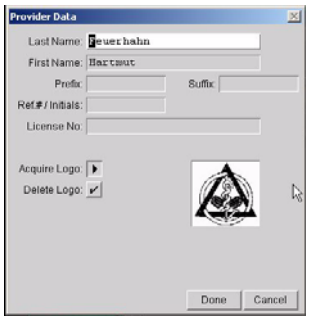
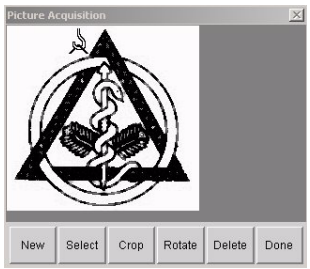
the scan is complete, the scanning software will close and the new signature/logo will be added to the Picture Acquisition box. Click on the picture. You may now *Rotate* or *Crop* the image.

Logos can now be assigned to individual providers: Open the *Provider Data* by clicking on the *Wrench* icon, then *Providers*; select a provider and click on *Modify*. Click on *Acquire Logo* to open the *Picture Acquisition* box which shows all scanned logos. Click on one, *Rotate* or *Crop* it if you wish, then click on *Select* to assign it to the provider. A logo assigned to provider #1 will become the default logo for all providers.





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Chapter 8

DEXimplant: Implant Planning and Monitoring

8.1 Introduction

Proper treatment planning as well as the selection of the proper implant length and diameter are crucial to the long-term success of the implant and restoration. The use of digital X-rays and the DEXimplant planning software greatly aids in this process.

Before an implant can be selected the anatomical foundation available to receive the implant must be carefully assessed. Several steps should be taken to complete the evaluation:

- Clinical evaluation of the oral cavity can provide important information about the health of the soft tissue at the proposed implant site.
- The bony foundation and ridge need to be clinically analyzed to ensure the presence of proper dimension and amount of bone for implant placement. The proper amount of bone should be present at the buccal and lingual aspects of the implant following placement. During the planning phase, it is useful to measure the existing bone foundation.
- The vertical height of the bone is best determined radiographically with a panoramic X-ray. The panoramic X-ray also shows existing teeth and – when properly calibrated - can be used to measure distances. It may well serve as a basis for placement planning and as a communication tool. DEXimplant supports implant placement planning on panoramic X-rays.
- It is recommended that based on these planning steps a surgical guide is constructed to aid in proper location and orientation of the implants in conjunction with the desired prosthetic results. Another panoramic X-ray, taken with the surgical guide equipped with steel pins in place, should be taken to compare the initial plan with the foreseen result of the surgery. The measurement tools of the DEXray software will help you in this evaluation procedure.

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Once the implants are placed, the healing process has to be evaluated from time to time by taking periapical X-rays. The DEXbone tool that comes with DEXimplant emphasizes osseointegration and eventual bone loss around implants.

Disclaimer: The DEXimplant planning and monitoring tool is a general aid to dentists working with dental implants. Note that DEXimplant is not intended to give precise measurements and is not able to be calibrated with extreme accuracy.

Professional dental experience and judgment combined with supplementary tools and techniques are essential to the reliable, safe and successful placement of dental implants.

ProVision Dental Systems, Inc. cannot be responsible for personal injuries incurred or liabilities or claims in connection therewith if DEXimplant is used inconsistently with the foregoing.

8.2 ACCESSING DEXIMPLANT

The DEXimplant and DEXbone tools are integrated into the DEXray software and are thus available for a thirty days trial period when DEXray is installed.

To use DEXimplant beyond the trial period, call the DEXIS technical support to see how to obtain the registration code.

To open DEXimplant, click the *DEXimplant* icon in the DEXray software.

8.3 IMPLANT PLANNING WITH DEXIMPLANT

The planning procedure supported by DEXimplant consists of the following steps:

- Take a panoramic X-ray with radiographic balls; calibrate the X-ray resolution by designating the radiographic balls of known diameter
- Select implant models and sizes
- Position the implants on the X-ray, rotate them and move them
- Print the panoramic X-ray with implants positioned; add a list of implants used.

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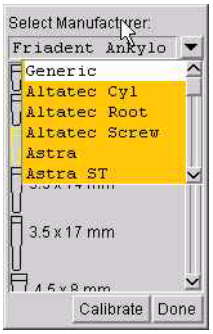
8.3.1 Calibration with Radiographic Balls

Accurate knowledge of the dimensions on the radiograph is a necessary precondition for the selection of the appropriate implant length and diameter. Since panoramic X-rays vary in magnification and never show the anatomical structures in actual size, the dimensions have to be calibrated by comparing them to the dimensions of a known object. Radiographic balls of known diameter (usually 5mm) have proven most useful and are especially supported by DEXimplant.

See “Calibration with Radiographic Balls” on page 74 for a description of this method.

Calibration with other objects, as described in “Calibration with Other Objects” on page 75, is also possible, but cannot give the same accurate result as the radiographic balls method. We therefore strongly recommend using radiographic balls of at least 5mm diameter.

8.3.2 The Implant Library



Open the DEXimplant tool by clicking on its icon or by hitting “n” on the keyboard.

The Implant Library is shown. Click on the down arrow to the right of the *Select Manufacturer* field to select the manufacturer and model you want. DEXIS provides templates for implants of most of the major manufacturers. If you do not find your favorite model, select *Generic* or a model that is similar, or notify DEXIS and provide the necessary information (product catalog and/or clear radiographic overlay template). We at DEXIS will do our best to complete the catalog.

8.3.3 Placing Implants

Click on an implant in the catalog and drag it over to the enlarged X-ray to the spot where you want to place it. The implant will be automatically rotated up or down dependent on the jaw you placed it on. It will be shown in the right size and as distorted as the nearest radiographic ball is. **But be aware:** the size can only be as accurate as the entered outline of the radiographic ball and as the panoramic X-ray itself.

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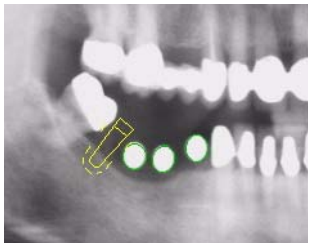

The implant placed on the X-ray is outlined and surrounded by a 1.5 mm safety margin. This margin is the minimum distance you should consider from the implant to adjacent vital structures.

Once you placed the implant you can:

- Move it by clicking into the center of the implant, then dragging it while holding the mouse button down.
- Rotate it by clicking at either end of the implant and moving the mouse to the right or to the left while holding the mouse button down.
- Remove it by clicking in the center of the implant and dragging it out of the image window.
- Replace it with a different model or size by dragging a different implant from the library onto it.

The performed action is indicated by the form of the mouse cursor: A cross with four arrows indicates movement, while an arrow-tipped bow indicates rotation. Fine, pixel by pixel movements can be achieved by hitting the arrow keys on the keyboard while the mouse cursor is placed over the implant.

The manufacturer, model, and size of a placed implant is shown in a help bubble when you move the mouse over it and wait a moment. When DEXimplant is closed, you may click on the implant to obtain information about it.

Implant placements are stored in the image files so that they are available after exporting and importing the image provided the implant library is present on the importing computer.

Placed implants are also shown by DEXview, the DEXIS image viewer.

8.3.4 PRINTING THE PLAN

Click on the *Print* icon and select the image containing placed implants. Implants placed on the image will be printed with it. Select *Add Notes* to print a list of the placed implants (manufacturers, models, and sizes) below the image. See “Communications: Printing from DEXray or DEXimage” on page 81.

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Alternatively you may print the image with placed implants in DEXwrite (see “Generating DEXwrite Reports” on page 131).

8.3.5 Communication with Colleagues

Consider sending images as files via disk or e-mail if you are sharing the treatment plan with another clinician. If your recipient is a DEXIS owner, the image file is sufficient to send. If your recipient is not a DEXIS owner, send with DEXview and the image can be opened. Not only will your implant models be visible, but the recipient will have the ability to change contrast and use ClearVu to gain more information.

8.4 Osseointegration Monitoring with DEXbone

The DEXbone tool helps in examining the bone around implants by emphasizing possible bone loss or bad integration of the implant. DEXbone uses sophisticated image processing techniques to find the special patterns produced by bone defects around implants.

8.4.1 Selecting the Region to be Examined

Take a periapical X-ray of the implant to be examined. Enlarge the X-ray and open DEXimplant by clicking on its icon or by typing “n”. Now drag a rectangle around the area to be examined by clicking on one corner and dragging the mouse while holding the left mouse button down. Do this for one side of the implant at a time; drag the rectangle so that about half of the implant and about the same amount of bone is contained. The DEXbone window will open showing the selected region enlarged. After some computation the DEXbone information will be shown.

Please note: DEXbone shows meaningful information only if the thread of an implant is visible inside the drawn rectangle. DEXbone works best if the implant is perpendicular on the radiograph.

8.4.2 Reading the DEXbone Information

DEXbone will show the following information:

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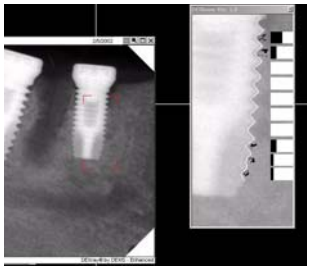
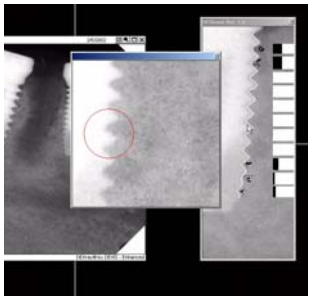


- The edge of the implant is shown as a white line. This serves as a confirmation that the software has successfully detected the implant. If this information is not shown correctly, the other information is meaningless. In this case, close the DEXbone window and select the region differently.
- Areas of suspected bone loss are shown in black. The size of the black spot directly relates to the size of the suspected defect.
- At the side of the DEXbone window, black rectangles indicate the severity of the suspected bone defect. Each rectangle relates to a shown bone loss area next to it. The wider the rectangle, the more severe the suspected bone defect.

8.4.3 Looking into Detail



Left-click on a shown bone defect and the area will be shown in a separate window in enlarged and contrast optimized fashion. This window will be shown as long as you hold the left mouse button down. You may “tack” it for permanent display by additionally clicking the right mouse button.

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Chapter 9

DEXwrite: Chairside Report Generator

DEXwrite allows you to create reports, letters or any type of document directly from DEXIS. Items such as patient, practice and provider data merge into letters and reports automatically. DEXwrite is specifically designed to work in harmony with DEXray, DEXimage and DEXscan. You can create a marketing letter, insurance report, referral letter or any type of correspondence you may need during your day from either the operational or front office computers.

It is suggested that you review the material contained within the DEXwrite portion of the manual before beginning your first letter or report so that you can maximize your benefits and minimize frustrations.

Once DEXwrite is installed (see "Software Installation" on page 13), you can start the program from the DEXIS Administration screen by first selecting the patient and then clicking on the *DEXwrite* icon. Alternatively, you may open DEXwrite from within DEXray or DEXimage either by clicking on the *DEXwrite* icon or by dragging an image onto the *DEXwrite* icon. In the latter case, the image will automatically be placed on the default report.

9.1 DEXwrite Screen Overview

The patient information appears at the top of the screen. The *Default Report* is the one that is now visible; it appears each time DEXwrite is opened. The name of this Default Report appears below the patient information. There is a drop-down arrow to the right of it. When clicked, the report library appears.

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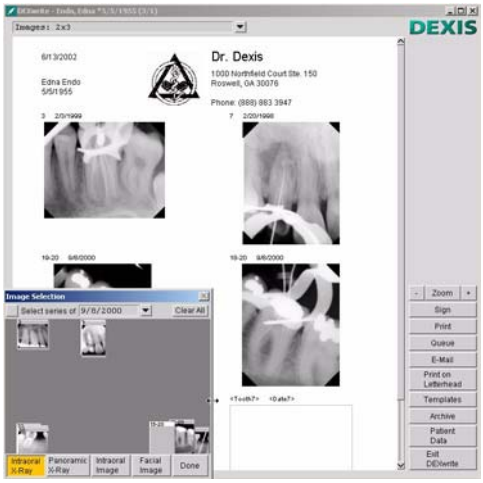
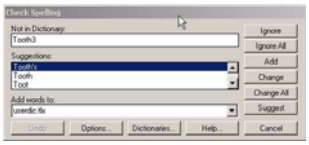
There are function buttons to the right of the shown report and an *Image Selection* box to the left.



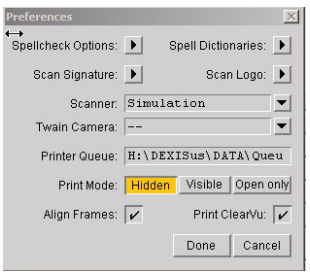
9.2 SETTING DEXWRITE PREFERENCES



Open DEXwrite Preferences by clicking on the DEXIS logo in the upper right corner of the DEXwrite screen, then click on *Preferences*.

Click on *Spellcheck Options* to select your particular options. This set of options functions in the same way as your word processing spellchecker.

Click on *Spell Dictionaries* to edit your spellchecker dictionary. This feature functions in the same way as your word processing dictionary; however, it also contains numerous dental/medical terms.



Click on *Scan Signature* to scan signatures for use with the Sign function. See “Sign” on page 128.

Click on *Scan Logo* to scan a practice logo. See “Scanning a Signature or Logo” on page 114.

Choose the appropriate scanner software under *Scanner*.

Twain Camera refers to camera software choice.

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Printer Queue refers to the folder where queued reports are held. The default queue location is a subfolder Queue in the DEXIS data folder (c:\dexis\data\queue). You may change this location to your desktop folder (usually C:\Windows\Desktop) or to the desktop of some other computer. If you do this, you will see the queued reports as icons on the desktop. You can then print them by dragging them onto a printer icon or delete them by dragging them to the recycle bin.

Please note: We suggest that you leave the default settings unless you are skilled in the use of Windows and with the creation of folders and icons.

Print Mode: DEXwrite prints reports by writing them to a PDF file and by launching Adobe Acrobat Reader. This program "reads and prints" DEXwrite reports.

Choose *Hidden* (the default setting) to hide Acrobat Reader entirely.

Choose *Visible* to have Acrobat Reader print the reports and at the same time show them on the screen.

Choose *Open Only* to view the report in the Acrobat Reader screen and print only from the Acrobat Reader screen. This selection gives you the most control but requires an additional step and slows down the printing process.

When the *Align Frames* box is checked frames will automatically be aligned when created or moved to a grid of 5 screen pixels in both directions. This makes it easier to obtain straight margins and to have pictures well aligned and of the same size.

Check *Print ClearVu* if you want DEXwrite to print all X-rays in ClearVu mode (sharpened) regardless of the settings for individual frames. This box is checked by default if printing in ClearVu mode is selected in DEXray.

Click *Done* to save any changes.

9.3 Generating Your First DEXwrite Report

Open a patient that has X-ray images in DEXray and click on the DEXwrite icon; the DEXwrite program will open.

In the *Image Selection* box double-click on the X-ray image to send it to the report. Click on the spots where you want to modify text and type in any changes. Click on the *Print* button to print the report.

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You now have you first DEXwrite report!

9.4 REPORT MANAGEMENT TOOLS

There are two components to DEXwrite: *Report Creation* and *Templates Construction*.

Report Creation is accomplished using existing templates.

Templates Construction is the process by which you design templates that have specific components to meet your needs.

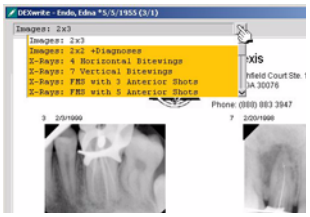
Each component has specific tools and functions.

The following describes the tools and functions for Report Creation:

9.4.1 DEFAULT REPORT

The report that is visible upon opening DEXwrite is called the *Default Report*. You will notice that the report appears with the appropriate patient and practice data already merged. This default can be changed in Templates Management discussed later in this section of the manual. In the example, we have chosen the Prostho Interim Report as our Default Report.

9.4.2 REPORT LIBRARY



To select a different report, open the *Report Library*. Click on the down-arrow next to the name of the current report at the top of the window. This will open a list of letters and reports from which to choose.

9.4.3 FRAMES

If you click in different areas of your report, you will notice that there are several sections to the report. Each section is housed in a box called a *frame*. Each frame contains specific data, such as text, logos and images. Once your basic template is constructed you will probably not need to make changes when creating a report. The exception may be in the text in the body of the letter or report. To change this text, click on the area to be changed and add or delete text. The function and modification of frames is

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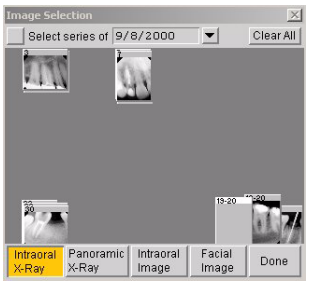
discussed in detail in the Templates Management section of the manual, see “Designing Custom Report Templates” on page 132.

9.4.4 Image Selection Box



Most of the letters and reports that will be created with DEXwrite will include images of one sort or another. The *Image Selection* box shows the visible images for this patient. That is, you will see all the X-rays as they were placed from the last time that patient’s file was accessed. Images should be enhanced prior to entering DEXwrite.

There are selection buttons at the bottom of this screen. From here you are able to select images from one of the other integrated DEXIS modules.

For example, clicking on the *Intra-oral Image* button will open a screen that stores intra-oral camera images within that patient’s DEXimage record.

Please note: DEXwrite only works with DEXray and DEXimage. You cannot add images captured with other image capture programs. You can, however, cut and paste and import and export images from other programs into DEXray or DEXimage and have them available for use in DEXwrite.

Click on the appropriate button to view and select *Intra-oral X-ray* images, *Panoramic* (along with cephalometric) *X-ray* images, *Intra-oral Camera Images* and *Facial Camera Images*.

To place a series of images into a letter or report, click on the down arrow to the right of the date to open the date menu. Choose the appropriate date and click on the check box to the left of *Select series of:*. All images for that date will move to the letter or report in one step.

To select individual images, click and drag the image to the letter or report or double-click on an image to move it to the next open image frame.

To move all images from the report back to the *Image Selection* box, click on the *Clear All* button on the upper right of the *Image Selection* box. To move an individual image, drag it from the report to the *Image Selection* box.

To minimize the Image Selection box, click *Done*.

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9.4.5 FUNCTION BUTTONS

Function buttons are located on the right side of the Default Report.

Images

Appears when the *Images Selection* box is minimized. To re-open, click on the *Images* button.

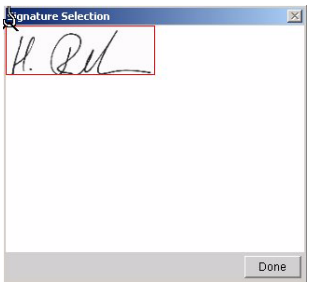
Spell Check

Click on this button and the *Check Spelling* screen will open. This screen functions in the same way as your word processing spellchecker. It will display the erroneous word and offer replacement options. You can choose to *Ignore* or *Change* words as necessary. You can also add words to your dictionary by using the *Add* button.

Zoom

Enlarges the report for easy viewing. Use "–" and "+" to decrease and increase the size of the report.

Sign



Allows a scanned signature to be placed into a letter. Click on *Sign* to open the *Signature Selection* box. You may double-click on a signature to put it into a predefined signature frame or you may drag a signature to the appropriate location.

Print

Print a report immediately.

Queue

Hold printing for later. An information box appears referring you to DEXIS Administration, *Print Queued Reports* where the choices are: *Print* to print a single selected report; *Print All* to print all reports in the Queue; *Delete* to delete a selected report from the Queue (it will remain in the Archive)

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E-mail

Electronically send a letter. A new e-mail message box opens with the appropriate information automatically entered: the doctor's e-mail address if it is in his or her *Referrer Data* screen; the sender's information; the patient's name and the letter as a .pdf (Portable Document Format) file — the recipient will need Adobe® Acrobat Reader® to open the letter. This is free software and can be downloaded from www.Adobe.com. Additional text may be added to your e-mail as with any other message.

Print on Letterhead

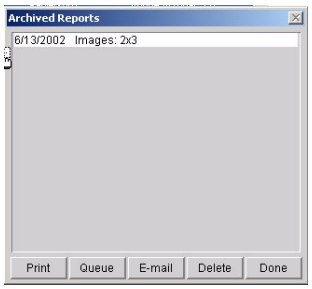
Hides the letterhead text and logo so that pre-printed stationery may be used. Choose *Print* or *Queue* to complete the process. Click on the *Print on Letterhead* button again to restore this text.

Templates

Opens the *Templates Management* screen, giving access to the templates for letters and reports.

Archive

Offers a report history for the patient. DEXwrite automatically stores reports in Archive. From this screen you may choose to *Print*, *Queue*, *E-mail* or *Delete* a stored report.



Text Blocks

Opens the list of *Text Block Categories*. You can *Add*, *Modify*, and *Delete* text blocks and text block categories, see "Reusable Text Blocks" on page 130.

Recipient

Opens the list of possible recipients, which is the same list as the list of referring dentists. You can add and delete names, modify recipient data, and select a recipient.

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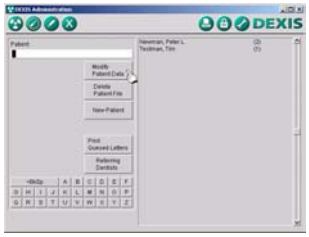


Patient Data

Allows access to the *Patient's Data* screen through DEXIS Administration where immediate changes in information for the patient are accomplished, including the selection of *Provider* and *Referring Dentist*, and acquisition of a patient picture with the *New Picture* button. Upon opening DEXwrite, this box will appear if any required information is missing.

Exit DEXwrite

Closes DEXwrite. After creating a report and upon exiting DEXwrite, you will be notified that the report has not been saved.

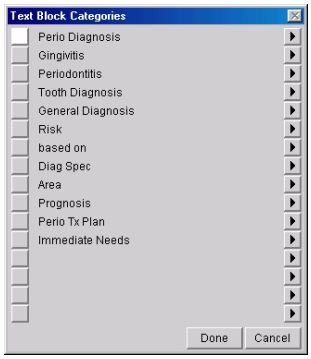
The report is saved only by choosing *Print*, *Queue* or *E-mail*.

9.4.6 Reusable Text Blocks

The concept of reusable text blocks was especially designed for dentists who want to generate reports well adapted to the individual case.

DEXwrite comes with some predefined text blocks which can easily be adapted and extended as need arises.

Text Block Categories



Click on the *Text Blocks* function button to display the list of *Text Block Categories*. The report text refers to these categories through the Parameter mechanism, see "Parameters" on page 136.

Click on one of the buttons to the right to modify the name of the category. Click on a button to the right of an empty line to add a category. In both cases an input box opens, that allows you to enter or modify the name. For all your categories, choose brief, unique names; do not use names already used in the software, like *Patient*, *Practice*, or *Provider*.

Click on a button to the left to open the corresponding category displaying the list of text blocks belonging to it.

Click *Done* to save changes, click *Cancel* to close the dialog without saving changes.

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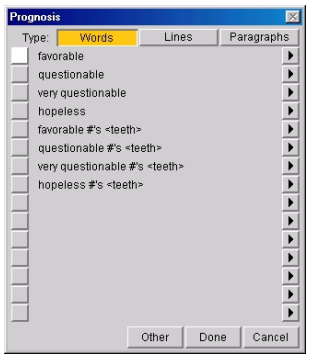
List of Text Blocks

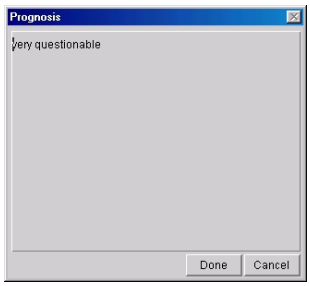


When you open a category, or when DEXwrite finds the name of a Text Block Category as a parameter in the report text, the list of text blocks belonging to the category is displayed.

The row of buttons at the top is used to define the type of text blocks listed:

- *Words* means, the text blocks consist of single words or phrases. If several are selected they will be interconnected by commas.
- *Lines* means, each text block will be placed on an extra line.
- *Paragraphs* means that the text blocks will be separated by empty lines if more than one text block is selected.

Below the selected category, the first few words of each text block are listed. If you click the buttons to the right of a text block the whole block is shown in an edit field and can be modified.



By clicking on the button to the left of a text block, the text block is selected for insertion into the text, replacing the parameter with the category name. Several text blocks can be selected; they will be interconnected according to the *Type* defined above.

Click on *Other* to open an input box and to enter a text block "on the fly." This text block is entered into the text, but not permanently stored. You may select one or more text blocks and additionally enter one by clicking *Other*.

Click *Done* to save your selection, click *Cancel* to cancel it.

9.4.7 Generating DEXwrite Reports

Now that you are familiar with the components of Report Creation, choose a patient and open DEXwrite. Follow these steps to create a report:

Choose a report from the *Report Library*

Select a recipient, if applicable

Select text blocks, if applicable

Place images into the report

Make text changes

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Add a signature, if applicable

Choose to *Print on Letterhead*, if applicable

Print, *Queue*, or *E-mail* to complete the process

To make changes to the text of an archived report, open the patient's *Archive*, select the report, change the text as needed and choose *Print*, *Queue*, or *E-mail* to save the changed report. Upon returning to *Archive*, the new report appears with a pipe symbol indicating that it is a revision.

Remember: At this point you are in Report mode. Any changes made here will only affect the report you are currently preparing for this patient.

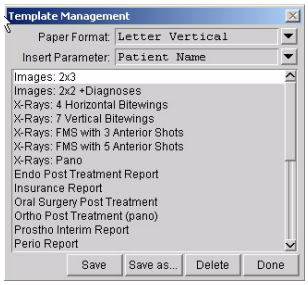
9.5 DESIGNING CUSTOM REPORT TEMPLATES

The following describes the tools and functions for Template Construction:

Throughout this section of the manual we will use the term *Template* to signify the basic template for a report or letter that has a specific layout and general predefined text; the actual text and graphics are not yet inserted. Templates are the basis for creating *Reports*. These reports are completed when you add your own text, pictures and patient's X-rays.

Please note: We suggest that you have one person in charge of Templates Management to avoid erroneous modification of Templates.

9.5.1 COMPONENTS OF THE TEMPLATES MANAGEMENT SCREEN



Click on the *Templates* button to open Templates management for this overview:

Paper Format

Select the size and shape of the final letter or report. The selected size should be equal to the size of the paper used. Please be sure that your printer supports the format you choose.

Insert Parameter

Offers a list of items to merge such as practice, referrer, image, patient and provider information. If you select an information item from this list, it will

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be inserted into the text at the current cursor position, see “Parameters” on page 136.

List of Templates

DEXwrite contains a long list of predefined templates to fulfill the requirements of different types of practices. You may choose the templates that work for your practice and have them become your Report Library, see “Report Library” on page 126.

Save

Choose after modifying a Template to save the changes.

Save As

Choose to give the modified version a new name thereby maintaining the original Template and creating a new one with the modified contents.

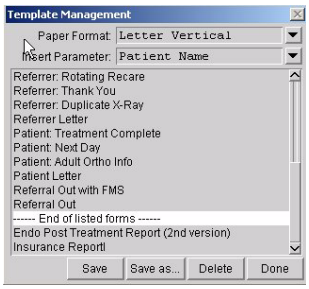
Delete

Deletes the selected Template entirely.

Done

Close Templates Management

9.5.2 Selecting the Templates For Your Personal Report Library



Open the *Templates Management* screen to select the templates to be contained in your personal Report Library. Scroll down the list of templates and locate the *End of Listed Templates* line. To choose a template for your Report Library, drag it above the *End of Listed Templates* line. To remove a template from your Report Library, drag it below the *End of Listed Templates* line.

By dragging a Template to the top-most position, it will become your Default Report and will be shown whenever you launch DEXwrite. For example, an Endodontist may choose to have *Endo Post Treatment Report* as the default report for the practice.

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When you have completed arranging, adding and subtracting report templates to your Report Library, click *Done* to exit the *Templates Management* screen.

9.5.3 COMPONENTS OF A TEMPLATE

Before initiating any changes, let's examine the components of a Template.

Frames

Click on different areas of the Template. You will notice red boxes. These boxes are called *Frames*. Every report is comprised of frames. Each frame is filled with text or images.

Using 'right-click and drag', you may move frames. In text frames, the left mouse button is used to move the text cursor and to mark text. Right click and drag on the borders to resize frames.

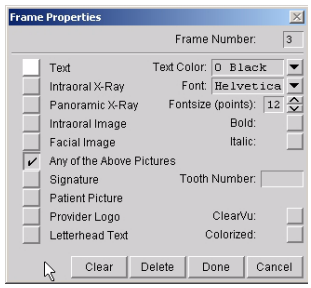
Text Frames are *bottomless*; they will expand as additional text is added.

To create a new frame, draw a box on the Template using click and drag.

Frames Properties Screen

When you create a new frame or right double-click on an existing one, the *Frame Properties* screen will appear. This screen provides the tools you need to select which type of item the frame is to contain and to specify the properties of the frame.

The following types of frames are designed to contain certain types of information such as:



Text: contains text only. You can specify the following additional properties:

- *Text Color*: select from the available colors.
- *Font*: select from the built-in fonts: Helvetica (serife-less font with variable width characters), Times Roman (variable width characters with serifes), Courier (typewriter style font - fixed width characters with serifes).
- *Fontsize* in points.

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• *Bold* and/or *Italic*.

Please note: You may copy and paste text to and from text frames and word processing programs. Highlight text, hold the *Control* key and hit the "C" key to copy; paste by holding the *Control* key and hitting the "V" key.

Intra-oral X-Ray: is for containing a picture, preferably an intra-oral X-ray. You can drag any picture into frames of this type, but only intraoral X-rays will be placed here by double-clicking on the image in the intra-oral *Image Acquisition* screen. You can also specify a tooth number or tooth number range. If you do this, the X-rays will be positioned automatically into the correct frames whenever you double-click on that particular X-ray when printing full mouth series or bitewing series templates. You can also specify whether the images placed into this type of frame will be printed *Colorized* or in *ClearVU* mode.

Panoramic X-ray: is for containing a picture, preferably a panoramic X-ray. You can drag any picture onto frames of this type, but only panoramic X-rays will be placed here by double-clicking. You can specify that pictures placed into frames of this type are to be printed *Colorized* or in *ClearVU* mode.

Intra-oral Image: is for containing a picture, preferably an intra-oral camera image. You can drag any picture into frames of this type, but only intra-oral camera images will be placed here by double-clicking.

Facial Image: is for containing a picture, preferably a facial photo or one stored in the Extra-oral Screen of DEXimage. You can drag any picture onto frames of this type, but only facial photos will be placed here by double-clicking.

Any of the Above Pictures: is for containing a picture. Any of the aforementioned pictures can be placed here by dragging or double-clicking. If you are unsure of the type of image to be placed into a frame, then select Any of the Above Pictures. In that way, double-clicking on any image will automatically place it into the next free frame.

Signature: is for containing a provider signature only. It will be filled by the *Sign* function.

Patient Picture: is for containing a Patient Picture. It will be filled automatically if a patient picture is available for the current patient. Patient Pictures

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are captured on the *Patient Data* screen using a scanner or digital camera as discussed previously.

Provider Logo: is for containing the Practice logo or Provider logo. This frame will be filled automatically if a practice logo or provider logo is available. It will not be printed if *Print on Letterhead* is selected.

Letterhead Text: is for containing text only. It will be printed only if *Print on Letterhead* is not selected. You can specify the font size in points as before.

Click on *Clear* to clear the contents of a frame for this template. Empty frames do not appear on printed reports. Click on *Delete* to remove the frame entirely. *Done* closes and saves changes. *Cancel* will not save changes.

9.5.4 PARAMETERS

Parameters are placeholders for data related text, which are filled in automatically by the computer. They are enclosed in angle brackets ("‹" and "›"). Since the computer must "understand" the nature of these parameters to know what text to place, the parameters must be spelled exactly as they are in the *Parameters* list. Therefore, we strongly suggest that you insert parameters by selecting them from the list rather than typing them in manually.

It is in text frames that information is merged using *Parameters*. These Parameters or merge items draw on information previously entered in DEXIS; therefore, you may need to edit information after an initial printing. Examples:

Data Related Parameters

Practice in parameters is a placeholder for the *Practice Name* in *Component Licensing*.

Prx (practice) *Address Line* 1,2,3, and 4 in parameters relates to the *Address Text* in *DEXray Preferences*.

Referrer information in parameters relates to data of the patient's *Referring Dentist*, selected in *Patient Administration*. The referrer data is entered and modified on the *Referrer Data* screen.

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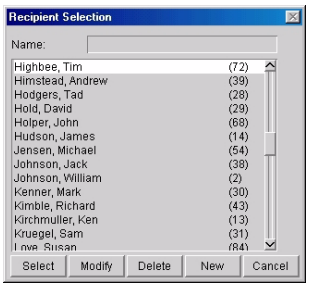

Recipient information in parameters relates to data of the report recipient, if that is not the referring dentist. If the software encounters a recipient parameter in the report it displays the list of recipients and allows to select from it.

Patient information in parameters relates to information on the individual's *Patient Data* screen.

Image Related Parameters

Pay particular attention to the *Image...* choices in parameters. These parameters link image information from a particular frame to text in another frame. The choices are:

- *Image Date* - the date an image was taken
- *Image Diagnosis* - any note attached to the image
- *Image Implants* - manufacturer, model, and size of placed implant(s)
- *Image Tooth #* - the tooth number(s) attached to the image

These parameters can be filled in only after a picture is selected. The parameters entered into the text when one of these menu points is chosen, all end in an underscore ("_"). If you leave the parameter as they are, the information will be taken from the first picture selected into a frame. If you want to refer to the picture in a specific frame, you have to replace the underscore by the *Frame Number* of the frame that is to receive the picture. The frame number is shown in the *Frame Properties* dialog. You can determine the frame number by double-clicking on that frame.

An example: You want to include the tooth number of an attached X-ray into your text. The X-ray is to be placed into frame number 7. If this is the only X-ray on the report, or if you do not mind which one is used to deliver the information, you put *‹tooth_›* into the report or simply select *Image Tooth*. You can get the software to enter the tooth number from this specific frame 7 into your text by entering *‹tooth7›* or by selecting *Image Tooth* from the list and by replacing the underscore with a "7". In this manner you are associating the image in the Image Frame with the tooth number presented in the text of the report.

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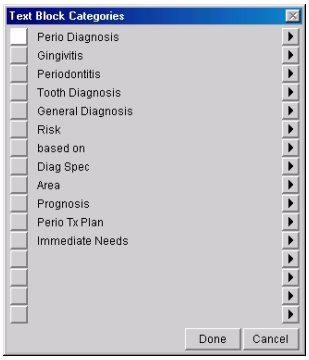

Text Block Categories

The *Text Block Categories* delivered with the system or added by you are also listed in the *Parameters* menu. If you select one of them or enter it into the text, enclosed in "‹" and "›", the software will show the selection menu for this *Text Block Category* allowing to enter one or more of the text blocks of this category into the text.

An example: You want to define a place in the report where one or more of the predefined diagnoses is to occur. You have a Text Block Category *Diagnoses*, with several text blocks to select from. If you put *‹Diagnoses›* into your text, or have the computer do that by selecting *Diagnoses* from the Parameter Menu, the list of diagnoses will be displayed when the report is generated. You select the applicable ones, and they will be inserted into the text replacing the place holder.

For more on Text Blocks, see "Reusable Text Blocks" on page 130.

Input Fields

Any parameter that could not yet be replaced when the report is to be printed, queued for printing, or e-mailed, causes an input window to be opened allowing you to enter text to replace the place holder.

An example: The report text contains *‹Remark›*. Since *‹Remark›* is neither a known parameter (like *‹Practice›* or *‹Patient›*) nor a *Text Block Category*, an input window is shown when you select to print the report, asking for the remark. It shows *‹Remark›* in the title bar.

9.5.5 SAVING THE TEMPLATE

After making changes to a Template, choose *Save* to make permanent changes to this particular Template, or choose *Save As* to give the modified Template a new name and therefore keep both the original and the new template. Choose *Delete* to remove the Template entirely. Remember, these are permanent changes.

If you try to exit without choosing any of these options, a warning will appear asking for a choice to save or not to save. This is a safeguard against losing changes made to Templates.

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9.5.6 Constructing your Own Template

The changes described in Templates Construction can be accomplished on individual reports outside of *Templates Management*; however, the changes will then take effect only for that current report and not for any subsequent report using the same template. It is only in *Templates Management* that permanent changes to Templates can be accomplished.

We suggest that you first become familiar with the letters and reports included with DEXwrite before attempting to alter existing templates or to create your own.

Select a Template to modify: We suggest that you construct your own template by selecting one that is similar, saving a copy under a new name, then starting from there.

Click on *Templates* to open *Templates Management*, select a suitable template from the list and click on it. Click on *Save as...* giving it a meaningful name. This way, the original will not be altered. Close and re-open Templates Management and choose the new Template. As with all newly constructed Templates, it will be at the end of the list. You might want to drag it up closer to the top.

Change text: Click on a text frame (the frame will turn red). The cursor will appear in the text box and can be moved by either clicking elsewhere in the box or by moving it with the arrow keys. Once the cursor is located in the proper position you can type additional text or delete text using the keyboard, much like you would with a traditional word processor.

Insert text parameters: Parameters are fields with specific names that will later be filled in with values by the computer. Parameters in DEXwrite are enclosed in brackets (“‹” and “›”), see “Parameters” on page 136. To insert a DEXwrite parameter, you move the cursor to the spot where you wish to insert it, then select the parameter from the list in the *Templates Management* dialog by clicking with the left mouse button. You open the Parameters List by clicking with the left mouse button on the down arrow adjacent to the *Insert Parameter* box.

Resize a frame: Move the cursor over an edge or corner of the frame, press the left or right mouse button and drag the border while holding the mouse button down.

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Move a frame: Move the cursor over the frame, press the right mouse button (cursor will turn into a hook) and drag the frame to the position you want.

Create a new frame: Move the mouse over an empty space of the report, press the left or right mouse button and drag open a rectangle. When you release the button, a *Frames Properties* screen will come up which allows you to select the type of frame this will be, see "Frames" on page 126. The dialog also allows you to specify the text properties, like size, font, and color, and to specify special picture modes (ClearVU, Colorized).

Modify the frame type: Double-click with the right mouse button on the frame to bring up the *Frames Properties* screen. You can then change the frame type. The screen also allows you to change the text size and to specify special picture modes (ClearVU, Colorized).

Delete a frame: Double-click with the right mouse button on the frame to bring up the *Frame Properties* screen, click on *Delete*, then *Done*.

Change the paper format for the template: Select the appropriate format from the list at the top of the *Forms Management* screen. Please be sure that your printer supports the format you choose. Not all printers support all formats.

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Chapter 10

DEXclaim: Images as Claim Attachments

DEXclaim is an image-forwarding program that allows you to select X-ray and/or camera images and other information and send them through FastAttach by National Electronic Attachments (NEA). DEXclaim is not a claim-submitting program. However, since it sends images in support of insurance claims, it becomes the claim-settling component for your image management program from DEXIS.

To use DEXclaim and FastAttach you must be submitting your standard insurance claims electronically through a stand-alone program or through your Practice Management Software (PMS) program.

The claim submittal process passes your claim through a *clearing-house* and the clearing-house then passes the claim to a *payor*, usually an insurance carrier.

If your standard claim requires a supporting image, the clearing-house or payor will notify you (usually the next day) either by an electronic message, or by mail. In response to the notification, you simply use DEXclaim to enter patient information, select the image(s), and send the *attachment* to NEA.

NEA then posts the attachment for the payor for review. Throughout this chapter, we refer to *attachment* as the image document sent from DEXIS and *claim* as the claim generated by your PMP's claims processing program.

DEXclaim is made of two components: DEXclaim by DEXIS and FastAttach by National Electronic Attachments (NEA). Like all DEXIS components, DEXclaim is automatically installed as part of the DEXIS suite. Through our partnership with NEA, FastAttach is also pre-installed for your convenience. Once you open DEXclaim, you will be asked to complete the NEA install and accept the end-user license agreement.

The DEXclaim icons appear on the DEXIS Administration, DEXray, and DEXimage screens. The function remains the same no matter where you choose to initiate the program.

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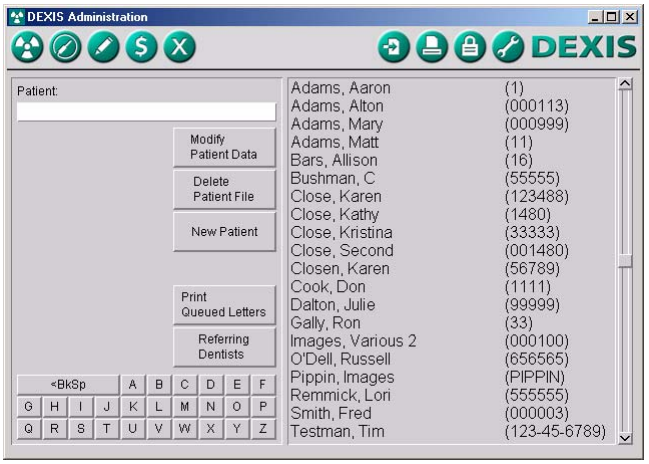
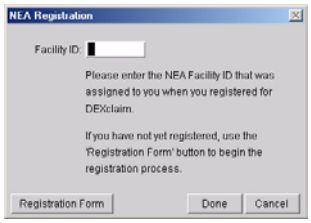
10.1 REGISTRATION

DEXclaim requires that you register with DEXIS and have a subscription from NEA. You will be registering these two components: DEXclaim by DEXIS, and FastAttach by NEA, covered here in that order.

Click on the *DEXclaim* icon to open DEXclaim.



DEXclaim may have been part of your initial purchase. If so, your DEXclaim Registration Number may already be entered during your DEXIS installation process. If not, or if you have yet to purchase DEXclaim, a screen appears asking that you enter a DEXclaim registration code. Click on *Later* to move to the next step.


NEA Registration
Facility ID:
Please enter the NEA Facility ID that was assigned to you when you registered for DEXclaim.
If you have not yet registered, use the 'Registration Form' button to begin the registration process.
Registration Form
Done
Cancel

The NEA Registration screen appears asking you to enter your *Facility ID* number. Enter your number, or to register and receive this number, click on *Registration Form*. Follow the instructions on the form; a DEXIS Customer Care representative will assist you in this step.

Please note: If you are currently an NEA subscriber, you will be able to click on the *Later* option to fully use the DEXclaim program for 30 days.

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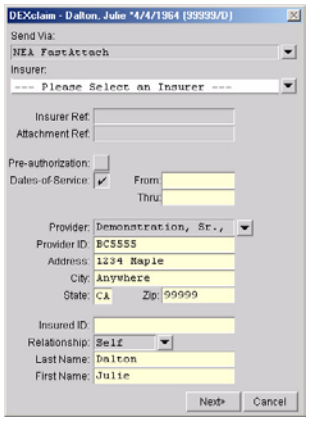
10.2 Sending images as attachments with DEXclaim



Images can be attached to **new** or **existing** claims which are sent through your current electronic claims-processing program.

For existing claims, your are notified that images are needed. Use DEXclaim to send the images as attachments, linking the attachment number to the originally submitted claim.

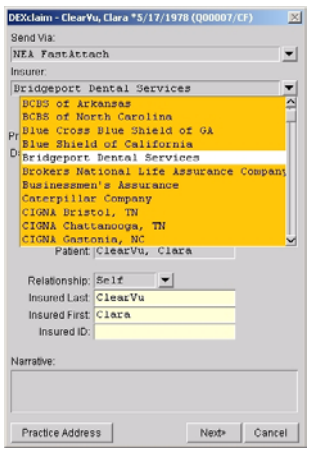
For new claims, the attachment is sent to NEA **first**, then the tracking number is inserted into the new claim as it is created.

The DEXclaim process for either case is as follows:

Select a patient

Select a patient and click on the *DEXclaim* icon. A DEXclaim claims information screen opens specific for this patient.

Enter Insurance Data



Send Via should remain *NEA FastAttach* unless you are verifying operation or instructing personnel. In this case, choose *DEXIS Demonstration*.

Choose the insurance company in the *Insurer* field.

Select *Pre-authorization* or *Dates-of-Service* for previously performed procedures. Fill in the dates of service.

Next, fill in the remaining highlighted fields. DEXclaim remembers this insurance information for this patient after it has been initially set. In the future, please verify the insurance information for the patient, change if necessary. Move to the next step by clicking on *Next*.

Attach Images

An image selection box and a form displaying the attachment and insurance information opens. Choose from any available DEXIS images including intra-oral X-rays, pans and cephs, intra-oral and facial camera images. Drag X-ray or camera images to the form placing images in the lower half of

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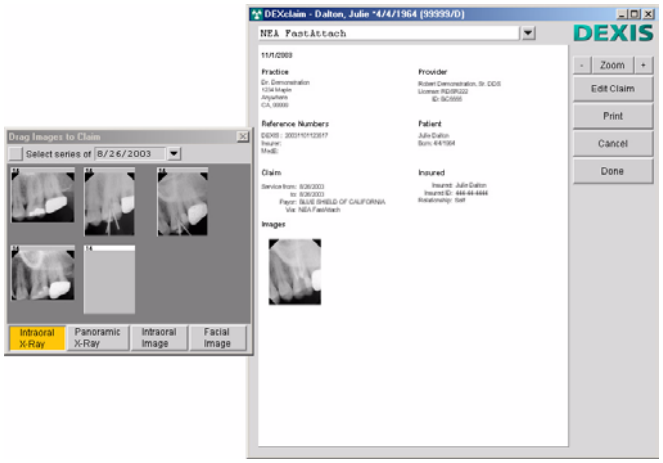
the page, randomly or in the mount. In the case of a series, you may select by date to move all the images for the series in one step.



Drag as many images as required. **Please note:** Should you select the wrong image, you must drag it back to its *home location* on the *Click Images or Drag to Attachment* box. The image is in its home location when the mouse changes to a hand dropping a document.

You should arrange images on the form and stretch them to size only if you intend to print a hardcopy for office reference. Otherwise, the arrangement and size of the images you place on the form is of no consequence, as the form you see will change format when sent. Instead, the images are always sent full size along with the claim data extracted in the format required by the payor.

To the right of the form are options:

- Use *Zoom* for easier viewing.
- Use *Scan* to open your installed scanner to scan and attach additional information, such as perio charts and student enrollment forms.
- Use *Edit* to change information on the form.
- Use *Print* to print a hard copy.
- Use *Cancel* to cancel the attachment.

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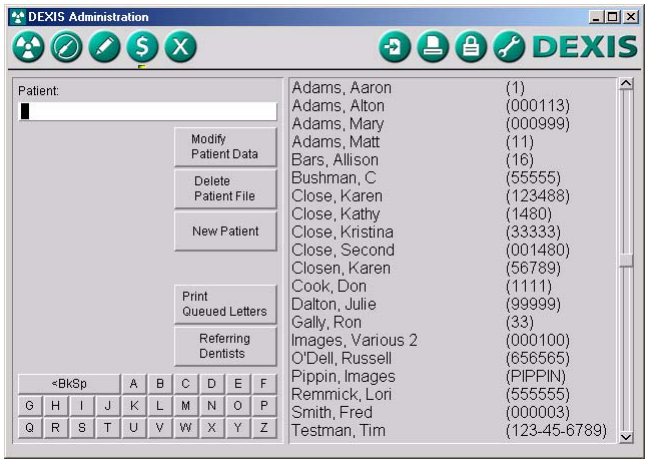
- Use *Done* to complete the attachment. This will send the attachment to the Attachments queue.

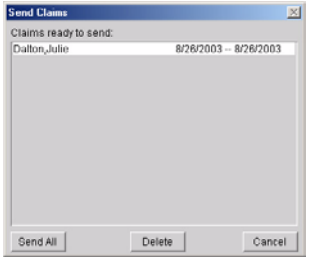
Continue with other attachments using the previously described process until you have selected all of the images required by your payor notifications or for soon-to-be generated standard claims.

Send Attachments

When you are ready to send these attachments, connect to the internet and click on the *DEXclaim* icon. **Please note:** A light under the icon indicates there are attachments ready to be sent.



The *Attachment Status* screen opens.



Click *Send All* to send all attachments to NEA. You must be connected to the internet at this point. You cannot edit attachments at this stage, only send them or delete them. You can select one, then use *New* to create a new attachment for that patient, then delete the erroneous attachment.

The NEA transmitting screen opens; click on *Send Attachments*. When the transmission is complete, the attachment transmission software will automatically print an *Attachment File Receipt* report to verify that you have successfully submitted your attachments. On this report you will find an NEA#

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for each attachment you have sent. You can also open *Reports*, pulling the tracking number from each attachment.

The final step is to enter the NEA tracking number into the remarks section of the electronic claim and to send the claim to your claims clearinghouse. Please note, when putting the NEA# into the notes section of your electronic claim that the first four characters of your notes must be *NEA#*.

Your Insurance Payor will immediately be able to view your attachments on the NEA site.

If you have yet to file a claim but would like to attach images and other information, create the attachment **first**, using the above steps, so that you can insert the tracking number into the claim.

10.3 Assistance

Throughout the DEXclaim process, dialog screens will appear should there be missing information, skipped steps, or verification needed.

For example:

If the patient's birth date or provider is missing, a dialog appears alerting you and leading to the *Patient Data* screen where you can make the additions. :

Should you click *Done* to move an attachment to the *Send Attachments* queue without adding an image, a dialog appears alerting you to do so. :

Should you click on the *DEXclaim* icon with no attachments in the queue (no light under the icon), a dialog will appear asking if you would like to check for updates.

10.4 Demo Mode

If you would like to use DEXclaim in Demo mode, enter the word *DEMO* for the Facility ID on the *NEA Registration* screen (see Registration). Choose *DEXIS Demonstration* in the *Send Via* space on the Patient's Insurance Data screen (see "Enter Insurance Data" on page 143). With these selections, you will be able to duplicate the entire process.

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APPENDIX A
Hardware and Testing

A.1 RECOMMENDED HARDWARE SPECIFICATIONS

Our current hardware system requirements are available on our website, from your representative and from our Customer Care Center. As technology changes, our requirements will be updated to reflect such changes. Please consult current *DEXIS System Requirements* before purchasing any hardware.

A.2 INSTALLATION VERIFICATION AND TESTING

This section allows for the verification and testing of your DEXIS software, DEXIS hardware and other hardware accessed by the DEXIS software.

Please verify your software installation, test the DEXIS sensor and print functions. Then test additional hardware **only** as it applies to your particular practice and purchased modules.

If your verification and testing do not produce the desired results, please contact DEXIS Technical Support for assistance.

Verify the installation of DEXIS software modules

Double-click on the *DEXIS* icon from your desktop to open *DEXIS Administration*. If all modules are installed properly you will see five icons on the upper left of the screen: DEXray, DEXimage, DEXwrite, DEXclaim, and Quit.

If the appropriate icons do not appear, call Technical Support for assistance.

Verify the installation of the Sensor drivers

Your sensor serial numbers are visible from the Intra-oral X-ray Capture screen in DEXray.

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Open the *DEXIS Administration* screen. Double-click on any patient's name to open the *DEXray* screen. You will receive a disclaimer. Read the disclaimer and choose *I Accept* to close it.

Type "x" on your keyboard. This will open the *Intra-oral X-ray Capture* screen (appears as a tooth chart).

Your sensor serial numbers should appear in the lower left corner of the *Intra-oral X-ray Capture* screen along with a box labeled *Other Sensor*. If no numbers appear, re-install the Sensor Disk(s), see "Load Sensor Driver File(s)" on page 16.

After re-installing, return to this screen to verify installation. If on a network, verify that the sensor number(s) appear on each workstation where X-rays will be taken.

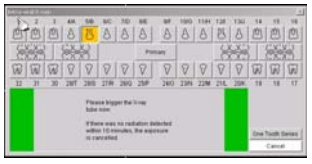
If the sensor numbers still do not appear, call Technical Support for assistance.

Test X-ray image capture with your DEXIS sensor

If separated, connect the sensor to the board aligning the red dots on both parts.

Insert the sensor/board into the PC Card slot. Caution – there are 2 slots; keep the board level, in one slot or the other. You may hear 2 beeps as the computer recognizes your sensor. The first time the board is inserted, Windows will recognize the new hardware and will install the appropriate drivers. Please wait until this procedure is complete.

Open the test patient's DEXray screen.



Type "x" on your keyboard. This will open the *Intra-oral X-ray Capture* screen (appears as a tooth chart).

Click on the serial number of the sensor you are using. Click on a tooth number. You will be asked to *Trigger the X-ray tube*....

Take an image: Place the flat part of the sensor toward the tube and place a coin between the two. Expose with radiation.

If you are unable to capture an image, your image does not appear, or you have images that do not resemble the X-rayed item, please call Technical Support for assistance.

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Test Print functions

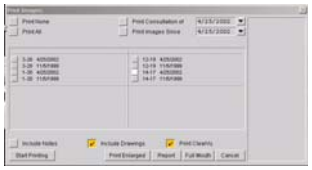
If you are using a new printer, follow the manufacturer's guide for installation and print a test page before entering DEXIS.

Please verify that your printer functions outside DEXIS.

For use with a non-networked laptop, you may need to shut down the laptop, attach the printer and restart the laptop.

If you are using an established network printer, or once you have printed a test page with a new printer, proceed to the test patient's X-ray screen.

Print from DEXray



Click on the *Print* icon to open the Windows *Print* screen. Select the printer to use, then click on *OK* to open the DEXIS *Print Images* screen. Click on your actual test image or click on the selection box listed in the center of the Print Menu screen. Then, click on *Start Printing*. The image will print. For network systems, print from DEXray on each workstation where the printer is accessible.

If the image does not print, call Technical Support for assistance.

Print from DEXwrite

If you have purchased DEXwrite, check for its print function. From the test patient's X-ray screen, click on the DEXwrite pencil icon on the upper right and click on the *Print* button on the right side of the report. The report will print. For network systems, print from DEXwrite on each workstation.

If the report does not print, call Tech Support for assistance.

Test Intra-oral Camera with DEXimage

Connect the proper cable from the intra-oral camera or microscopic camera to the computer. Call the camera's technical support for recommendations for the purchase for *S-Video* or *Composite (RCA)* connection. Once the camera is connected and turns on, enter DEXimage.

From the test patient's DEXray screen, open DEXimage using the *Wand* icon on the upper left. Click on the DEXIS logo icon, then *Preferences* and the *DEXimage* tab to open DEXimage Preferences.

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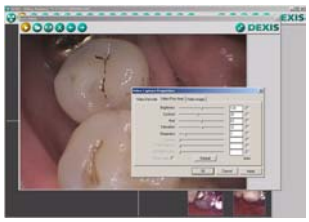

Under *Video Hardware* choose *WDM Full Screen*.

If you will be using a foot pedal or wand capture device, choose *COM1* (or the correct COM or GAME port) under *Pedal at*.

Click *Done* to save your selections.

Click on the *Wand* icon on the upper right of the toolbar to start the *Live Video* screen.

If there is no live video, click on the W*rench* icon. Dependent on the capture card used and its drivers, you will see different popup dialogs where you can set video formats, standards, and connectors.

Choose *S-Video* or *Composite* as it applies to your type of connection from the camera to the computer, and *NTSC* under *Standard*. Under *Video Format*, choose *16 bit RGB*.

These are the most common settings for intra-oral cameras in DEXimage. Other settings may be necessary depending on the installed capture card.

If live video still does not appear, call Tech Support for assistance in choosing the proper settings.

Once live video appears on the screen, click on the *File* icon to capture. A thumbnail of your image will then appear on the *Preview Panel* to the right. Click on the *Quit* icon and the captured image will appear on the DEXimage screen. (If you are on the intra-oral screen, you will be asked to assign a tooth number to the image).

If your captured image did not move onto the DEXimage screen, call Technical Support for assistance.

Test your DEXIS-provided foot pedal

Once on the *Live Video* screen, tap the pedal quickly to freeze the image; holding the pedal down longer will capture the image.

If you are unable to capture an image with your foot pedal, call Technical Support for assistance.

Test your Digital Camera

DEXIS owners may capture from the *Patient Data* screen under New Picture. Please verify that your camera functions outside DEXIS.

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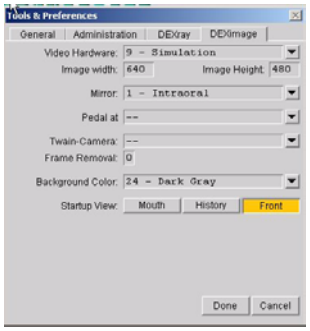
Patient pictures into Patient Data



You may use your digital camera to capture patient pictures, which will appear on the DEXIS Administration screen.

Set your type of digital camera interface from the DEXIS Administration screen. Open *Tools and Preferences* by clicking on the *Wrench* icon, then click on the *DEXimage* tab. If you use a Twain compatible camera, select it under *Digital Camera*. If you use a memory card, select "--" instead. Connect your camera or insert your memory card to your computer.

Memory card/PC card adapter use

If images do not appear in the *Picture Acquisition* box, consult the directions for your camera and make necessary changes. If images still do not appear, call Technical Support for assistance, see also "Memory Card with Card Reader" on page 97.

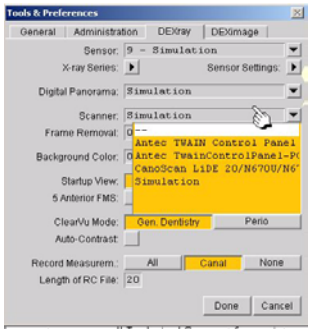
Camera with Twain interface

If your installed camera software does not open through DEXIS or you are unable to acquire an image, call Technical Support for assistance, see also "Twain Interface" on page 98.

Test your scanner

DEXscan owners may scan standard film (intra-oral or extra-oral) into DEXray.

Please verify that your scanner functions outside DEXIS.



Scan X-ray film into DEXray

Select the scanner to use in DEXIS Administration Preferences. Open DEXray for your test patient and select the extra-oral screen. Click on the scanner icon to open the scanner software. Scan a grayscale image (B/W photo), see "Scanning X-Ray Films" on page 109.

If your scanner software does not open or your image does not appear, consult the directions for your scanner and make necessary changes. If an image still does not appear, call Technical Support for assistance.

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Test your E-mail function

If you have Internet service and have a MAPI-compliant e-mail program such as Outlook Express, you may use the DEXIS e-mail feature.

To test your e-mail function, proceed to the test patient's DEXray intra-oral X-ray screen where images appear. Click on the *Export* icon to open the *Export Images* screen. Click on *E-mail*, then click on your actual test image or click on the small selection box in the center of the *Export Images* screen. Click on *Export Images* and then click *Done*.

Your e-mail program's *New Message* screen will appear with the X-ray image as an attachment.

If your e-mail program's *New Message* screen does not open, call Technical Support for assistance in choosing the appropriate settings.

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APPENDIX B

Keyboard Use and Shortcuts

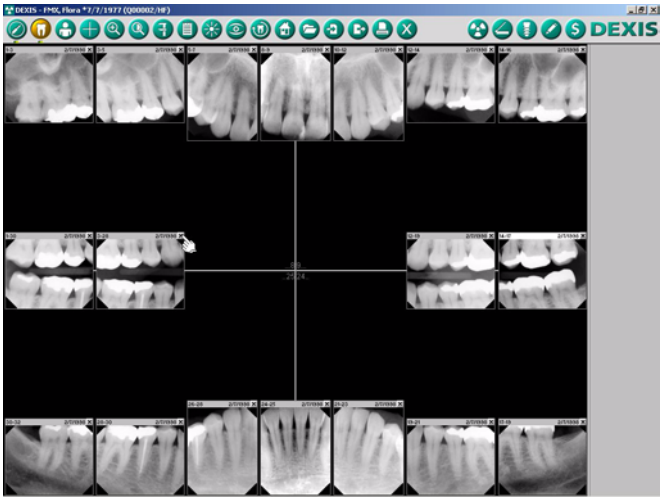
For those who feel more comfortable using the computer keyboard to move around the program, DEXIS provides a variety of key combinations to make this possible.

In Focus/Appropriate Key

Before listing the actual keystrokes, it is important to understand that at any given time, there is **one** item on the screen that is highlighted or *in focus*; and that only the item *in focus* receives the keystrokes.

Examples:

If an X-ray is highlighted (in focus), hitting the "R" (the appropriate key) on your keyboard will cause the image to rotate.



In the *Intra-oral X-ray Capture* screen, if a tooth on the chart is highlighted (in focus), hitting the *Enter* key will set that tooth up for X-ray.

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Upon changing to *History* mode on the *Visible Images* screen, when *Done* is highlighted (in focus) hitting the *Enter* key will change the X-ray screen from *Mouth* view to *History* view.

If a function screen, such as *Navigator*, *Measurement*, or *Notes* is open then it becomes the screen that is in focus, not the program screen. To close it and proceed with other keystrokes, you must hit the "O" key.

The Arrow Keys

The arrow keys move the focus from item to item on that particular screen. Depending on the type of item (X-ray image, text etc.) that is in focus, different results may occur. We strongly suggest that you take the time to work with the keystroke combinations in order to better understand their utilization.

The arrow keys on the keyboard will most often move you from one X-ray image to another. If there is more than one X-ray on the screen, try hitting the arrow keys to move from image to image. The right and left keys move right and left; the up and down keys similarly move up and down. The image that is highlighted with a white border at the top is the item in focus at that time. If a magnified image is on the screen, the arrow keys will change brightness and contrast, since only that image in *in focus*.

The Arrow Keys have a special function when used in:

Measurement: They move the marker (the small circle located on the image) within the image to assist in placing the marker at the appropriate measurement point, see "Measurement on Images" on page 69. The red marker will only appear after you activate the Canal feature to indicate your intention to measure the root canal.

Zoom: The arrow keys move the magnifying glass. Hitting the *Enter* key displays that portion of the image.

Accessing the DEXray icons

From the DEXray screen, hit one of the following keys to access the corresponding icon and its function:

v DEXimage opens

a Access Intra-oral X-ray Screen

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f Panoramic (Facial) Screen opens

o Overview mode shows all images at once

z Zoom (Magnification) magnifies a portion of the image

s Spotlight shows a portion of the image with maximized contrast

m Measurement begins the measurement of the image in focus

t Annotation Box opens for the image in focus

e Enhancements open for the image in focus

u ClearVu the image in focus

r Rotate the image in focus

b Reset or take back the image in focus to original settings

h Archive or history opens

‹ Import Images screen opens

› Export Images screen opens

p Print

q Quit DEXray

x Take an X-ray image

c Scanner software opens

n DEXimplant opens

w DEXwrite opens

l DEXclaim opens

i Information Screen opens , then on to Preferences

Accessing the DEXimage icons

From the DEXimage screen, hit one of the following keys to access the corresponding icon and its function:

x DEXray screen opens

a Access Intra-oral Images Screen

f Facial Images Screen opens

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o	Overview mode shows all images at once
z	Zoom (Magnification) magnifies a portion of the image
s	Spotlight shows a portion of the image with maximized contrast
t	Annotation Box opens the for the image in focus
m	Measurement begins the measurement of the image in focus
e	Enhancements open for the image in focus
r	Rotate the image in focus
u	Mirror (flip) the image in focus
b	Reset or take back the image in focus to original settings
h	Archive or history opens
‹	Import Images screen opens
›	Export Images screen opens
p	Print
q	quit DEXimage
v	live Video capture
c	Digital camera or Scanner capture
n	DEXimplant opens
w	DEXwrite opens
l	DEXclaim opens
i	Information Screen opens , then on to Preferences

Text Fields

When it is necessary to issue a command while a text field is in focus (a box where text is typed in to add information), hold the *Alt* key while pressing the command key at the same time. The arrow keys move within the text field until the last character when the cursor will move to the next neighboring element.

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Other Keystroke Tools

Enter

When a button is highlighted or in focus, hitting the *Enter* key is the equivalent of pressing that button, thus starting the function of that button or toggling its state.

When an image is highlighted or *in focus*, hitting the *Enter* key will automatically enlarge the image. Hitting the *Enter* key a second time will return the image to its standard size. If the image is magnified, hitting *Enter* will return the image to standard enlargement.

Delete

If an image is enlarged, hitting the *Delete* key will return the image to its standard size. Hitting the *Delete* key when the image is in its original size will delete the image. **Please note:** DEXIS will ask for confirmation before deleting any X-ray image.

Escape

Hitting the *Escape* key will close a function box such as *Measurement* or *Enhancements*. Hitting it again will close the enlarged image.

Spacebar

Hitting the *Spacebar* will pause a function, such as the scroll feature in navigator or the playback of a voice note

F1 Key

If you hit the *F1* key while a button or icon is in focus, the Tooltip of this button will be shown.

F2 Key

When an item with a drop-down box is in focus, hitting the *F2* key will open the drop-down box. You may then use the arrow keys to move through the box.

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F3 Key

When hitting the *F3* key, the focus will be moved to the leftmost icon in the tool bar.

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APPENDIX C

Screen and Window Adjustments

You may view the DEXray and DEXimage screens in a variety of sizes, positions and even view multiple screens simultaneously.

Sizing and positioning

As with any Windows box, the size of the DEXray and DEXimage screens may be changed.

To change the size of a screen, put your cursor on the outside edge or corner of the screen until the double arrows appear. Click and drag the screen to the desired size. You may drag it to any position on the screen by clicking and dragging on the title bar.

To maximize for use, click on the *Maximize* button in the upper right corner of the screen. To return this screen to the last size, click on the *Restore* button also in the upper right corner.

Of course, you may minimize the screen, sending it to the task bar by clicking on the *Minimize* button located in the same area. Click on the corresponding tab on the task bar to restore to the last size.

Screen size changes are remembered in the DEXIS system. When the screen is changed to this size, closed and reopened for the same or another patient, it appears in the same size as when last viewed.

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APPENDIX C

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Appendix D

Interfaces, Bridges, and Links

D.1 DEXpan

DEXpan is the link between digital panoramic software and DEXIS. It allows for the transfer of a digital panoramic/cephalometric X-ray image from the digital panoramic software to the DEXray extra-oral screen. Once on the screen, it can be stored in DEXray along with the patient's intra-oral X-rays. It is available for use by the Image Management Tools.

To operate this program, you must have an authorized digital extra-oral (panoramic) system whose software is recognized by DEXIS. Please contact Technical Support or your representative for information on specific product recommendations.

DEXIS recognizes two types of interfaces: Panoramic digital sensor that is attached to a panoramic X-ray unit and a phosphor plate scanner. Both systems take the place of standard film. In the latter, you have the ability to use panoramic and cephalometric plates if your unit accepts these.

Once your digital extra-oral hardware (digital sensor on panoramic X-ray unit or phosphor plate reader) and panoramic capture software are installed, the DEXpan program can be activated.

To start the process of obtaining a digital image, open the patient's DEXray extra-oral screen.

Digital Sensor

Place the patient into the panoramic unit. To capture the image, click on the X-ray capture icon or type "X" on your keyboard to open the panoramic capture software and expose the digital sensor as you would standard film.

Once complete, the image appears in the panoramic X-ray capture screen. Close this screen to move the image into the DEXray extra-oral screen.

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Phosphor plate-to-digital system

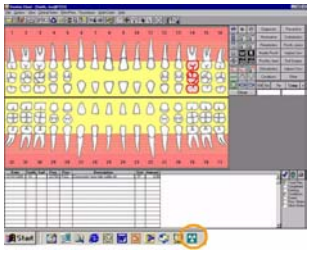
Start by loading the plate into the cassette and mounting the cassette on your panoramic unit. Place the patient into the panoramic unit and take your image as you would with traditional film.

Once the exposure is complete, remove the plate from the cassette and load into the dedicated reader according to the manufacturer's instructions.

Click on the X-ray capture icon or click "X" on your keyboard to open the panoramic capture software. Choose plate size and click the *Start* (or *Scan*) button.

Once complete, the image appears in the panoramic capture screen. Once this screen is closed, the image moves to the DEXray extra-oral screen.

D.2 DEXIS TO DENTRIX LINK



Installation of the DEXIS-to-Dentrix link should not be attempted without assistance from Technical Support.

All patients are entered and chosen through Dentrix. If you enter patients directly in DEXIS Administration, images taken for that patient will not be visible when the link is established at a later time.

Once the DEXIS-to-Dentrix link is installed and verified, you will have both the DEXray and the DEXimage (if installed) icons on your desktop. For ease of use, please drag these icons from the desktop to the quick launch bar. If DEXimage is one of your purchased modules, drag both the DEXray and the DEXimage icons to your quick launch bar. If not, drag only the DEXray icon to the quick launch bar.

Open DEXray or DEXimage from Dentrix

To start the link, open Dentrix. Select a Dentrix screen, such as the chart feature.

Next, choose a patient. Please verify that you have indeed selected a patient before moving to the next step.

Now, click once on the DEXray or DEXimage icon on your launch bar. This will open the DEXray/DEXimage screen for the patient chosen in Dentrix.

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Once the DEXray/DEXimage screen opens you may size, maximize for use, minimize and reposition it as with any screen in Windows.

To size and position the DEXray/DEXimage screen anywhere on the Dentrix screen place your cursor on the edge of the screen in a corner, click and drag to size. To move the sized screen, click on the title bar of the screen and drag it to the desired location.

When you are ready to choose another patient in Dentrix, do so in the usual manner **without** closing the DEXray or DEXimage screen. Once the newly selected patient's Dentrix screen opens, the DEXray or DEXimage screen will automatically switch to that patient. Since DEXIS remembers screen size changes, the screen will be the size it was for the previous patient.

Should you inadvertently close DEXray or DEXimage entirely, simply reopen it as previously described.

D.3 DEXIS to EagleSoft Link

Installation of the DEXIS-to-EagleSoft link should not be attempted without assistance from Technical Support.

All patients are entered and chosen through the EagleSoft software. If you enter patients directly in DEXIS Administration you need to assign the EagleSoft chart numbers.

Enter the EagleSoft ChairSide program and select a patient. Please verify that you have indeed selected a patient before moving to the next step.

Click the picture of the X-ray head on the front screen to open the DEXray screen for your selected patient. You may also access the DEXray screen from the EagleSoft Chart screen by selecting *X-ray* from the drop-down menu at the bottom of the screen.

Please note: If you are not properly linked, you will receive a warning message. Please close DEXIS, open Eaglesoft, and begin again.

Once the DEXray screen opens, you may size, maximize for use, minimize and reposition the DEXray screen as with any screen in Windows.

To size and position the DEXray screen anywhere on the EagleSoft Chairside screen, place your cursor on the edge of the screen in a corner and

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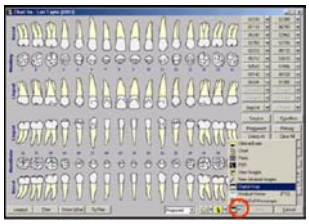


click and drag to resize; to move the resized screen, place your cursor on the title bar of the screen and drag it to the desired location.

Maximize to switch between the intra-oral and extra-oral DEXray screens, to use any of the DEXray icons, or to switch to the DEXimage screen.

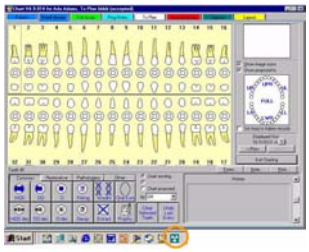
You may resize the DEXray screen and the EagleSoft Chart to suit your needs.

When you are ready to choose another patient in EagleSoft, **close the DEXray or DEXimage screen for the current patient.**

Select a new patient and re-link to DEXIS as previously described.

D.4 DEXIS TO PRACTICEWORKS LINK

Installation of the DEXIS-to-PracticeWorks link should not be attempted without assistance from Technical Support.



All patients are entered and chosen through the PracticeWorks software. If you enter patients directly in DEXIS Administration you need to assign the PracticeWorks chart numbers.

Once the DEXIS-to-PracticeWorks link is installed and verified, you will have both the DEXray and the DEXimage (if installed) icons on your desktop. For ease of use, please drag these icons from the desktop to the quick launch bar. If DEXimage is one of your purchased modules, drag both the DEXray and the DEXimage icons to your quick launch bar. If not, drag only the DEXray icon to the quick launch bar.

Open DEXray or DEXimage from PracticeWorks

Enter the PracticeWorks program and select a patient. Please verify that you have indeed selected a patient before moving to the next step.

Move to the selected patient's Soft Tissue or Hard Tissue chart.

Now, click once on the DEXray or DEXimage icon on your launch bar. This will open the DEXray/DEXimage screen for the patient chosen in Practice-Works.

Please note: If you are not properly linked, you will receive a warning message. Please close DEXIS, open PracticeWorks, and begin again.

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Once the DEXray screen opens, you may size, maximize for use, minimize and reposition the DEXray screen as with any screen in Windows.

To size and position the DEXray screen anywhere on the PracticeWorks screen, place your cursor on the edge of the screen in a corner and click and drag to resize; to move the resized screen, place your cursor on the title bar of the screen and drag it to the desired location.

Maximize to switch between the intra-oral and extra-oral DEXray screens, to use any of the DEXray icons, or to switch to the DEXimage screen.

You may resize the DEXray screen and the PracticeWorks Chart to suit your needs.

When you are ready to choose another patient in PracticeWorks, do so in the usual manner **without** closing the DEXray or DEXimage screen. Once the newly selected patient's PracticeWorks screen opens, the DEXray or DEXimage screen will automatically switch to that patient. Since DEXIS remembers screen size changes, the screen will be the size it was for the previous patient.

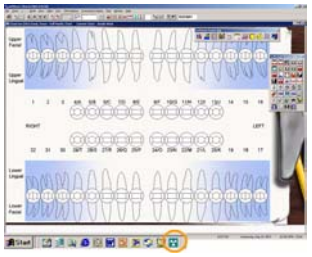
Should you inadvertently close DEXray or DEXimage entirely, simply reopen it as previously described.

D.5 DEXIS to SoftDent Link

Installation of the DEXIS-to-SoftDent link should not be attempted without assistance from Technical Support.

All patients are entered and chosen through the SoftDent software. If you enter patients directly in DEXIS Administration you need to assign the SoftDent chart numbers.

Once the DEXIS-to-SoftDent link is installed and verified, you will have both the DEXray and the DEXimage (if installed) icons on your desktop. For ease of use, please drag these icons from the desktop to the quick launch bar. If DEXimage is one of your purchased modules, drag both the DEXray and the DEXimage icons to your quick launch bar. If not, drag only the DEXray icon to the quick launch bar.



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Open DEXray or DEXimage from SoftDent

Enter the SoftDent program and select a patient. Please verify that you have indeed selected a patient before moving to the next step.

Move to the selected patient's SoftChart.

Now, click once on the DEXray or DEXimage icon on your launch bar. This will open the DEXray/DEXimage screen for the patient chosen in SoftDent.

Please note: If you are not properly linked, you will receive a warning message. Please close DEXIS, open SoftDent, and begin again.

Once the DEXray screen opens, you may size, maximize for use, minimize and reposition the DEXray screen as with any screen in Windows.

To size and position the DEXray screen anywhere on the SoftDent screen, place your cursor on the edge of the screen in a corner and click and drag to resize; to move the resized screen, place your cursor on the title bar of the screen and drag it to the desired location.

Maximize to switch between the intra-oral and extra-oral DEXray screens, to use any of the DEXray icons, or to switch to the DEXimage screen.

You may resize the DEXray screen and the SoftChart to suit your needs.

When you are ready to choose another patient in SoftDent, do so in the usual manner **without** closing the DEXray or DEXimage screen. Once the newly selected patient's SoftChart screen opens, the DEXray or DEXimage screen will automatically switch to that patient. Since DEXIS remembers screen size changes, the screen will be the size it was for the previous patient.

Should you inadvertently close DEXray or DEXimage entirely, simply reopen it as previously described.

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APPENDIX E

Backing Up Your Image Files

The DEXsafe program allows for the backup and restoration of all DEXIS data. To use this feature you must have a specific backup area or device denoted with a drive letter.

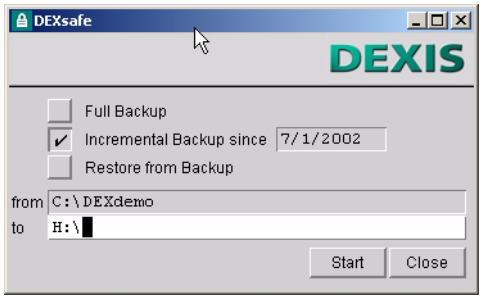
Once you choose and install a specific backup device, locate the drive letter: From your desktop, double-click on *My Computer*. The device and its drive letter will be listed.

From the DEXIS Administration screen, click on the *DEXsafe* icon to open the DEXsafe screen.

Choose *Full Backup* to backup all data since the first use of DEXIS. Choose *Incremental Backup since* to backup data since a certain date. DEXsafe will show the location of the DEXIS data in the *from* field; enter the drive letter of your backup device in the *to* area.

Click *Start* to start and *Close* to exit.

If you need to restore your data, Technical Support will assist you in using the *Restore from Backup* feature.



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APPENDIX E

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Appendix F

Frequently Asked Questions

1) Question: Why do I get the message, "Patient Data-File Not Found."

Answer: Usually this message means that you have lost access to either your local drive or to your network. The patient's data is stored in the dexis\data directory (folder) either in the local c:drive or on your network drive.

2) Question: How do I delete a patient?

Answer: First, you must delete all images in the patient's file. Then, go to the DEXIS Administration Screen, choose the patient and click on Delete.

3) Question: I took X-rays in the wrong patient's file. How do I move them into the correct patient's file?

Answer: First, export the images from the wrong patient to the hard disk. DEXIS will copy and place them into a holding folder. Once the images are exported, open the correct patient's file. Import the images from the hard disk. Lastly, delete the images from the incorrect file.

4) Question: Why does my image look fuzzy on the screen?

Answer: Verify that you are using the proper sensor number when taking images. Verify that you have the proper exposure setting and that the cone is touching the face.

5) Question: Why does my image look better on the screen than when printed?

Answer: This is often the case even using advanced printers. Print the image using a higher dpi on your printer. Try using different types and quality levels of paper.

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6) Question: How do I change a patient's information?

Answer: From DEXIS Administration, choose *Modify* for the selected patient. Make the changes and click *Done* to save.

7) Question: How do I change the practice name once I am using DEXIS?

Answer: From the DEXIS Administration screen, click on *Tools and Preferences*, the *General* tab, and then *Component Licensing*. Once on this screen, call DEXIS Technical Support to assist you in making this change and obtaining new registration codes.

8) Question: What if I have more than one sensor?

Answer: See "Load Sensor Driver File(s)" on page 16.

9) Question: What if I loose the diskette that came with my sensor?

Answer: Contact DEXIS Technical Support to arrange to have this disk recreated. We can mail a new disk and/or send the sensor drivers via e-mail.

10) Question: Can I print images in ClearVu format?

Answer: Yes. You can print individual X-rays or a full mouth series in ClearVu by choosing *Print ClearVu* in the DEXIS Print Menu.

11) Question: How can I determine if I am using the correct exposure?

Answer: See "Adjusting the X-ray Source" on page 19.

12) Question: Can DEXIS images be copied and then pasted into other programs?

Answer: Yes, enlarge and enhance the desired image. While holding down the *Control* key on your keyboard, drag the image onto the application.

13) Question: When I opened a patient's file, some of the images were not visible. Are they lost?

Answer: DEXIS allows you to select certain images and the view in which you would like them to be displayed. Click on the *Archive* icon to see a full history of images for the patient.

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Appendix G

Additional Help and Support

DEXIS Technical Support

1-888-88DEXIS (1-888-88-33947) option 3

Available Monday through Thursday 8:00 AM – 8:00 PM EST

Friday 8:00 AM - 6:00 PM EST

E-mail: support@DEXray.com

DEXIS on the Internet

http://www.DEXray.com